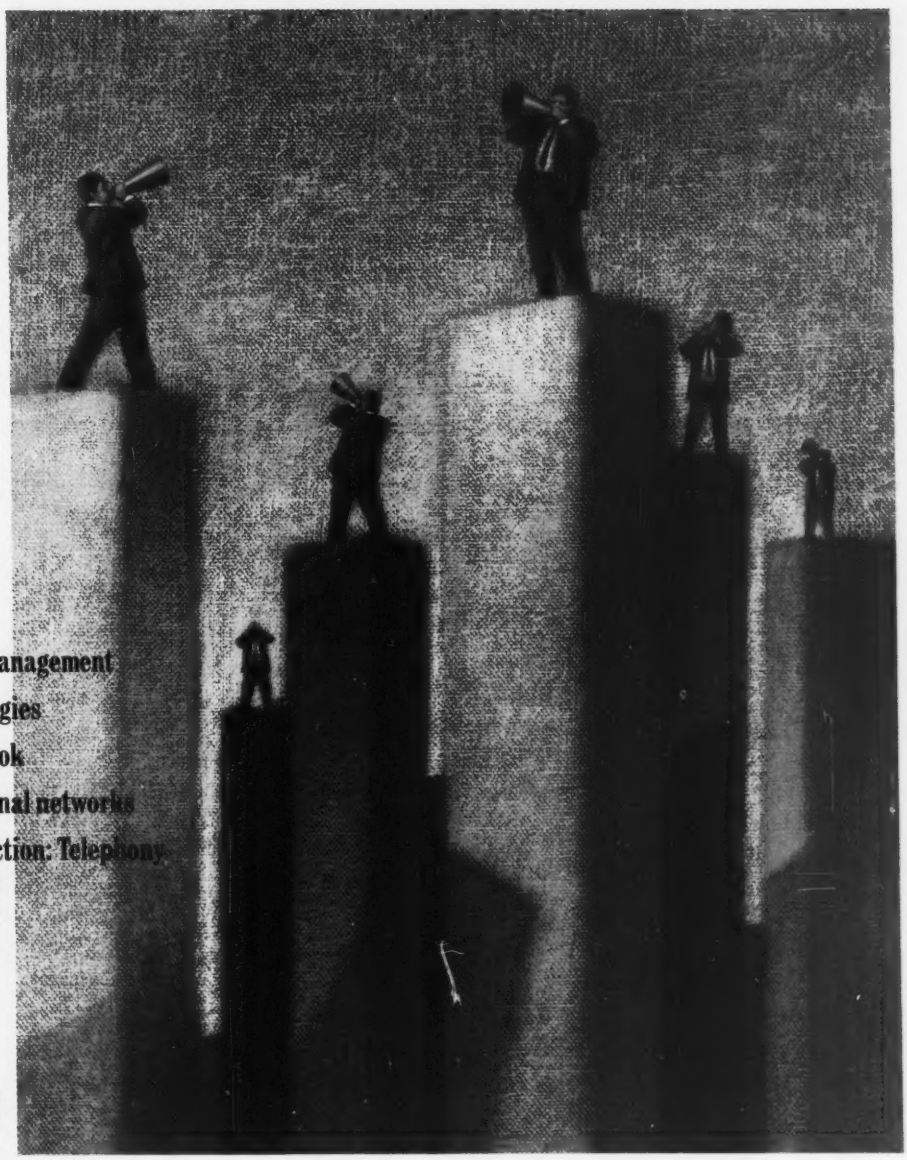
SEPTEMBER 9, 1987
VOLUME 21, NUMBER 36A

COMPUTERWORLD

FOCUS

Critical connections



- Network management
- LAN strategies
- ISDN outlook
- Multinational networks
- Special Section: Telephony

Communications

In 1962, we were already busy solving complex networking problems. Which is interesting because at that point some of them didn't even exist.

For 25 years, Codex has been a networking company. Concentrating on only one business: communications.

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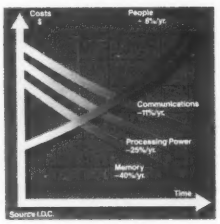

We can show you how a Codex network can be more profitable and more productive for your company.

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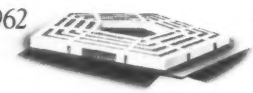
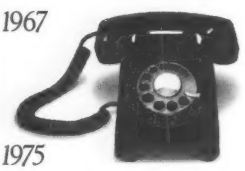
This requires us to invest in R&D and to be very active on today's international industry standards committees, helping to create the kind of "open architecture" that will allow you to link equipment from many vendors in a more productive way.

1962 

Codex develops its first data communications product for secure government applications.

1967 

Codex announces the first commercial 9600 bps modem. In 1976, our technology is adopted as the international standard by the worldwide CCITT committee.

1975

Codex announces the first statistical time division multiplexer and pioneers the concept of network control.

1984 

Codex introduces breakthrough technology and architecture that transforms its new generation of high speed modems into a "network systems resource." In 1986, the first software option – a complete communications test package is announced.

1985

Codex introduces gateways that allow separate networks to be combined.

1985

Codex introduces the first 19,200 bps modem with built in network control as a standard feature to optimize throughput and minimize downtime.

1987

Codex combines multipoint modem and multiplexer technology to allow independent applications – using different protocols – to share the same communications line.

Codex hasn't just developed a lot of networking solutions. We've practically developed the whole business of networking.

All of this is the reason Codex is the preferred brand of data communications professionals. And why 97% of the Fortune 100 use Codex equipment.

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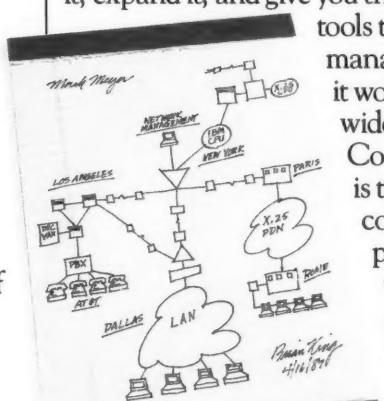
So if you've got a network requirement and you're looking for someone to help you equip it, expand it, and give you the tools to manage it worldwide, Codex is the company to deal with.



At Codex, we don't have set solutions – we work with your current environment. Which is why we spend a lot of time drawing diagrams like this.

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in focus

THE CASE FOR NETWORK MANAGEMENT

Multivendor networks, multiple protocols and proprietary equipment are part of the legacy of networking. Frustrated users are turning to network management vendors to make sense of the jumble and provide network connectivity. Read about the latest breakthroughs and hottest products in the net management field. By Stan Kolodziej. Page 16.

NETWORKS IN A STRANGE LAND

Setting up an international data network can be a trying venture. Where technology and equipment take precedence in domestic links, politics and regulations are the biggest headaches when data goes overseas. See what the experts advise and how others have fared in getting information to foreign places. By Avery Jenkins. Page 25.

SHEER POWER!

For today's office applications, the Intel 80386 will find its most widespread use in network servers. But can a PC network utilizing these servers rival networks using minis as servers? This analyst looks at the powerful 386-based offerings out now and future solutions that will take advantage of OS/2 and the OS/2 LAN Manager. By Michael D. Millikin. Page 21.

A LAN strategy

By Rebecca Hurst. Product and standards are only two components of a network strategy. Corporate goals, users' needs and financial demands must also be taken into account for local-area network success. This article outlines how to plan the best network for your organization. Page 31.

Communications at Warner

By Rebecca Hurst. Warner Communications is associated with the glamour of rock stars like Madonna, movie stars like Jack Nicholson and cartoon stars like Bugs Bunny. But behind all this glitz sits the director of corporate information services, making sure the multinational company's processing systems work and communicate as effectively as possible. Page 41.

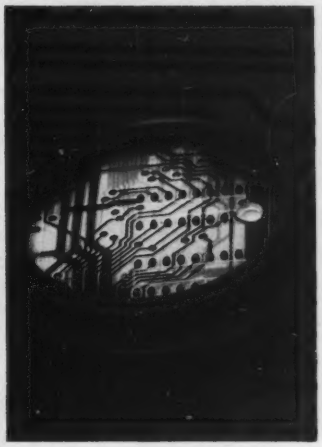
PCs and IOS

By Stan Kolodziej. Integrated office systems play a key role in those installations reflecting an MIS concern for control. The author shows how IOS have evolved and what users are accomplishing with this technology. Page 45.

ISDN in an SNA world

By John Pickens. Because of IBM's pervasive presence in the corporate marketplace, acceptance of ISDN may hinge on solutions to connecting with IBM systems. And IBM's Systems Network Architecture may just be that solution. Find out how well IBM equipment and ISDN connect. Page 47.

SPECIAL SECTION



Telephony

A new breed of phone is on the market now. The area of telephony consists of machines that range from simple hand-held systems to full-fledged videophones. Whatever their form, these voice/data products can be valuable tools for firms. Features Editor Michael Tucker examines the current generation of phone technology. Page 35.

COVER BY SIMON NG

Digital has it now.

For Hardee's, the nation's fastest growing hamburger chain with over 2700 restaurants, tight control over a widespread and increasingly decentralized operation has become an essential ingredient in their success.

"We give our managers the power of centralized computing in their own decentralized environments," points out Bill Burd, vice president of Management Information Services, "and at the same time, Digital's innovative approach to networking information still lets us tie it all together here at corporate."

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"Digital's network helps Hardee's keep in control, from the counter to corporate headquarters."

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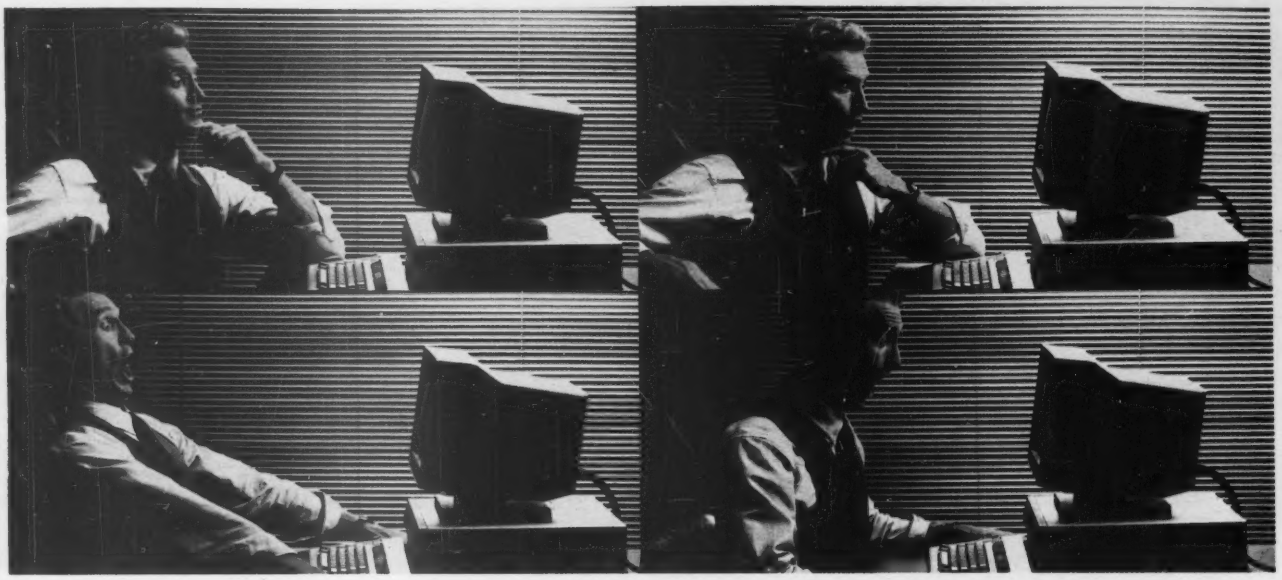

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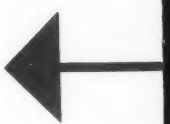

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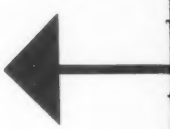

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FROM THE EDITOR

Connection hungry

Sometimes you only have to hear a phrase once to know it's destined to be the up-and-coming buzzword. "Networked computing" appears to be just that kind of nouveau phrase. A cousin to connectivity, networked computing places its emphasis on connections and communications links. Without usurping the functions of the mainframe or the stand-alone personal computer, networked computing treats processors as indistinguishable units on the network. Digital Equipment Corp. has been a proponent of this kind of thinking for several years.

This push toward companywide integration and connectivity can be seen as one reason for the abundance of mergers occurring in the communications industry. As competition for connectivity dollars has heated up, vendors are forming strategic alliances or merging in order to offer a more complete line of communications products and technology alternatives to connection-hungry customers. As these vendors unite to broaden their offerings, products will become less proprietary because users will expect more from a single vendor or product line.

However exciting these trends may be, MIS managers should step back and take a cold, hard look at their companies' connection needs. Complete connectivity may not be in many companies' best interests. MIS should not be too easily swayed by pressure from eager end users and top management or by vendor claims. Traditionally, vendors have offered only their own proprietary systems that did not share a common system environment. The existence of these diverse communications standards has made integration among systems difficult and unwieldy. Only recently, due largely to overwhelming user demand, have vendors started to provide hybrid solutions. The process, however, is not a simple one and will take time to implement.

In addition to the potential technical problems, the benefits of integration have not always been clear-cut, either. MIS cannot always justify costs, oftentimes because the need for users to communicate is not always immediate enough to warrant a major system changeover. Although connectivity and networked computing are worthwhile long-term goals, MIS should be aware of all the aspects and assess potential trouble spots before wholeheartedly embracing these concepts in the short term.

Ann Dooley

VAR finds IBM's PC actions unjust to customers, industry

The *Computerworld Focus* August editorial about the PS/2 was so impressive that I felt compelled to congratulate you for having the foresight to write it.

As a value-added reseller for AT&T products, The Bud Co. has long been aware of the need for national standards within the industry. We feel that Big Blue has done its customers and the industry an injustice. As for us, we are going to support those companies, both software and hardware, that are striving to settle on a national personal computer standard we can *all* live with. Let competition start after that, because the cream will rise to the top — it always has!

W. F. Hampton
President
The Bud Co.
Pensacola, Fla.

Fortune 10 user claims PS/2 'dog' is well bred

Having just placed an order for 50 IBM Personal System/2s for my office, I was interested in *Computerworld Focus*'s views on this item. Frankly, I was slightly taken aback by the negative viewpoint on the PS/2s in the August editorial, "A dog of a deal."

I understand that a large percentage of corporate America does not have the means or desire to upgrade every time IBM makes a change, especially one that means no more IBM Personal Computer XTs and ATs. However, as an employee of a Fortune 10 company, I have had the opportunity to experiment with all types of PCs. Once I got my hands on a PS/2, I was converted forever. The machine will be an integral part of the future and the new wave of PCs.

As an advocate of the latest and greatest, I would strongly recommend that corporate America keep an open perspective in its approach to this "dog;" it seems to be very well bred.

Tracy Sharp
Darien, Conn.

Hot commentary on a cool technology

In reference to the News & Analysis article "Superconductors: Hot Times for a Cool Technology" in the August 12 issue of *Computerworld Focus*, I think the author should be a bit more careful in reporting units of measure for temperatures. In the article, he refers to "oxides that were superconductive at a 'warm' -98 degrees Kelvin." Because Kelvin is used as the absolute scale (that is, 0 K is absolute zero), the temperature -98 K is theoretically impossible. The temperature should have been listed as 98 K, or -175 degrees Centigrade.

The July 1987 issue of *Popular Science* reported that a recently discovered yttrium-barium-copper oxide material had a transition temperature approaching 240 K (-27 degrees Fahrenheit). It is upon such materials that the hope for a superconducting computer is based.

Jimmy Vaughn
Chattanooga, Tenn.

As an electrical engineering student, I read the article on superconductors with interest. I would like to inform you, however, the grade of measure is just Kelvin, not degrees Kelvin.

Mark A. Logan
Indianapolis

Q AND A

David L. Nelson

A look toward 1990: Apollo exec promotes network computing concept

David L. Nelson is one of the founders, the vice-president of advanced technology and chief technical officer for Apollo Computer, Inc. in Chelmsford, Mass.

Last May, Apollo announced that it was forming a new organization, the Network Computing Forum, to promote the concept of network computing — the construction of networks that are themselves computing devices. The forum would include end users and software and hardware vendors, including Apollo's own competitors. Nelson served as the driving force behind the forum's organization. He recently spoke with *Computerworld Focus* Features Editor Michael Tucker regarding network computing and the forum.

What is the Network Computing Forum?

Briefly, the forum is an organization that currently has nearly 60 members. The group is composed of more or less four types of members: large end users like Boeing Corp.; equipment manufacturers like Apollo; software application developers; and finally, some university and government labs. They all have, as a common interest, the urge to explore the concept of network computing.

Are you a standards group, like the Corporation for Open Systems (COS)?

No. [The forum] is a member of the COS, and the members agree that standards are important. But our philosophy is not to get tied down in the rather cumbersome work of standards processor. The forum is, rather, a clearinghouse — an environment and a context in which we can exchange ideas about network computing as well as a place where end users can speak directly to vendors and vendors can speak directly to suppliers.

So the forum is a discussion group?

That's our charter. Except, of course, that we go beyond discussion. For instance, the forum promotes products that further network computing. The network queuing system developed by Cray Research, Inc. is being promoted by the forum. MIT's Netwindows system is being promoted by the forum. Apollo has developed a product called the Network Computing System, and we have submitted it to the forum.

What is network computing?

Network computing is rather strictly defined as executing single applications across networks of computers. Let me emphasize the word *single*.

If you're like me and most other people in the industry, you tend to think of an application as something that executes on a very specific machine. You might think of a budget as something that you prepare under Lotus Development Corp. 1-2-3 that runs on a PC. We associate data bases with IBM mainframes. And we associate various engineering applications with the [Digital Equipment Corp.] VAX.

Network computing challenges all that. It redefines the application as a program that runs on a network. It would be a single program running on multiple machines in a coherent, distributed manner.

This means that a developer could, for example, produce an application that would run on a single workstation or as a distributed application on a network of heterogeneous machines.

How is this possible?

Well, basically, software developers would organize their applications as sets of procedures. For example, you might have an application that would be composed of three sets of modules — one doing all your computational work, one doing your graphics and a third doing your data base work. Now, if you're selling a product to a customer who has one machine, you simply include within your installation procedures the instructions to link those three together into one application — which is what people already do today.

But let's say that you go to a much more sophisticated customer. Let's say this customer has a Cray supercomputer, four VAXs and several Apollo workstations. Now, let's further suppose that this customer would like to run the numerically intensive part of the application on the Cray or the VAXs or the Apollo, depending on environment or even the time of day. . . . Normally, the numerical module would run on the Cray, except when the Cray gets overloaded, in which case it shifts to the VAXs, unless they fail, in which case it shifts to the local Apollo.

So when you provide this user with instructions on how to load the application on the Cray, the VAXs and the Apollo machines, you also distribute [a system like] the Network Computing Runtime System, for example, which Apollo has developed.

The Network Computing Runtime System sits at each node, traps the procedure calls and sends them out to the appropriate foreign machine. This is all done in a manner that is transparent to the actual application.

When the application now makes calls to the numerical module, sometimes the calls go to the Cray and sometimes to the other machines, depending on the situation.

What are Apollo's objectives in being involved in the forum?

We have talked to several end users. Many of them were doing long-term planning, and they had run into a problem. Unless they considered IBM or DEC, they could not put together a coherent computer strategy. If they went to IBM or DEC, they would have to choose one vendor, and that vendor would tell them what their strategy was.

But most users don't have a single-vendor strategy. We recognized that this was limiting the growth of the entire industry, and more importantly, it was limiting the growth of that part of the industry that was neither DEC nor IBM — particularly our part of it and the people who build servers and various network components.

So, a big part of our motivation is that we want to provide customers with a vision of how multivendor, heterogeneous computing can be done in the 1995 time frame.

What haven't I asked?

You might want to know when users can expect to see real applications coming out of the forum. I'm looking to the fall of this year for some interesting results. But, again, we like to think of network computing in terms of the 1990s.

MANAGER'S CORNER

Small changes for big results

Jim Young

Communications environments do not easily accommodate change because it affects standards, protocols, dissimilar devices and different media. Moreover, because organizations depend on communications on a day-to-day basis, top management is many times not likely to permit much experimentation.

One way to reconcile change with the status quo, however, is to approach technological innovations step by step. The first move to innovation can frequently reduce costs without major accommodations by an environment. Some communications examples help to illustrate this point.

IBM's recent announcement of its T1 strategy has renewed the promise of integrated voice/data communications. Products are available today that oversee the hardware and applications for voice and data transmission. Unfortunately, many companies are not yet prepared to embrace this degree of technology because of their equipment, priorities or lack of faith.

Yet technologies such as T1 will be essential in incorporating voice/data innovations. Keep in mind, too, that you need not make exhaustive use of a new technology. For example, several products, including IBM's T1 announcement, permit selective adoption of T1 for the simple expedient of transmitting voice over data, while never integrating the two. This option can make financial sense if your company's voice and data transmission costs between discrete locations are typically high. It may be a small but significant step toward technical sophistication.

Another area in which technological advances can benefit your company is wireless communications. There are products that, through the use of radio transmission, can replace costly links or deliver access to otherwise "unlinkable" nodes. These products range from one-way data transmission systems to fully functional two-way transmission systems. Operating over several miles, an advanced transmission system can lower your costs by avoiding direct wiring, modems, complicated networks and telephone usage. It can also permit product sharing in an office environment.

Best of all, once a technology like this is in place, its true advantages can begin to blossom. Rapid response to equipment moves, immediate and simple tie-ins to a network and even mobile networking are among the possible benefits.

The local-area network (LAN) arena has also experienced certain technological leaps. LANs reorganize the way users share data and devices as well as how group work is accomplished. The management tasks are often significant when implementing a LAN, and DP managers are, therefore, often correctly hesitant to charge headlong after LAN technology. However, by reducing some easily eliminated printers or acquiring a site license for popular software, MIS can save enough money to make a LAN investment a good deal.

A final sector in which to look for technology improvements is electronic mail. Companies typically put off acquiring an E-mail system until they are ready to mount a full-scale changeover because of the fundamental changes such a system might force on workers. When the E-mail coup occurs, DP must deal with the challenges of promoting new behavior and learning how to manage the technology.

A more subtle approach is to examine routine but costly communications that electronic mail can reduce or replace, such as some overnight mail services, facsimile transmission, telephone costs and so on. A network may already be in place to serve other locations, and a simple software purchase could pay for itself by avoiding some of these costs. Once a system of such potential operates successfully for isolated uses, others with less quantified but equally valuable needs will be lobbying for its use. At this stage, E-mail can be expanded. It is a steady, reliable way to implement technology in a controlled manner.

These are only a few examples of ways to put costs up front when looking at investing in communications technology. Besides ensuring early payback, this approach allows MIS to assimilate the management responsibilities of new disciplines. Most importantly, this approach shows top management the benefits of technology while highlighting savings — an area many executives accuse DP managers of overlooking.

Young is managing director of MIS for the Wheeler Group, a division of Pitney Bowes in Hartford, Conn.

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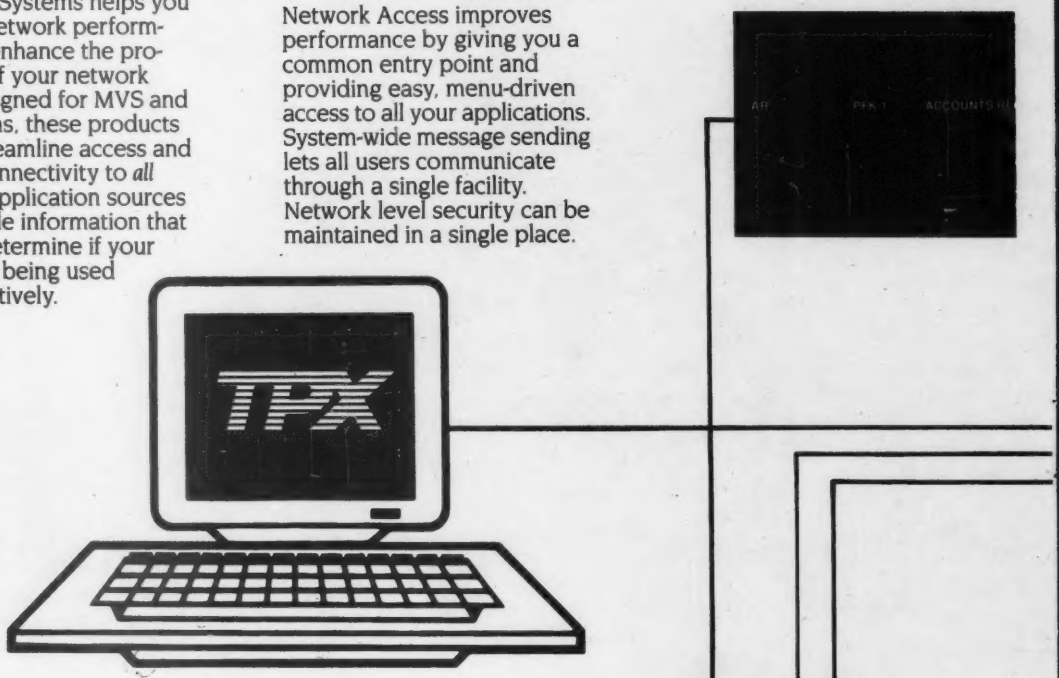

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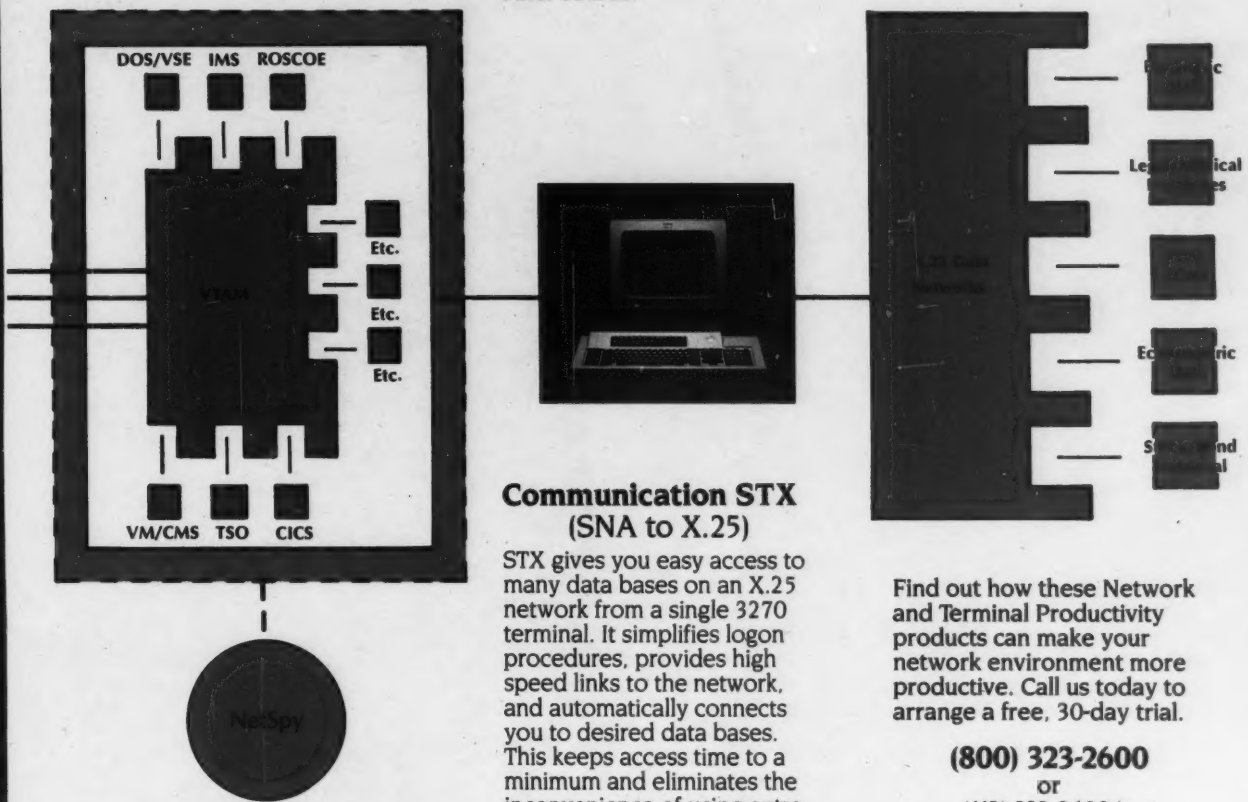

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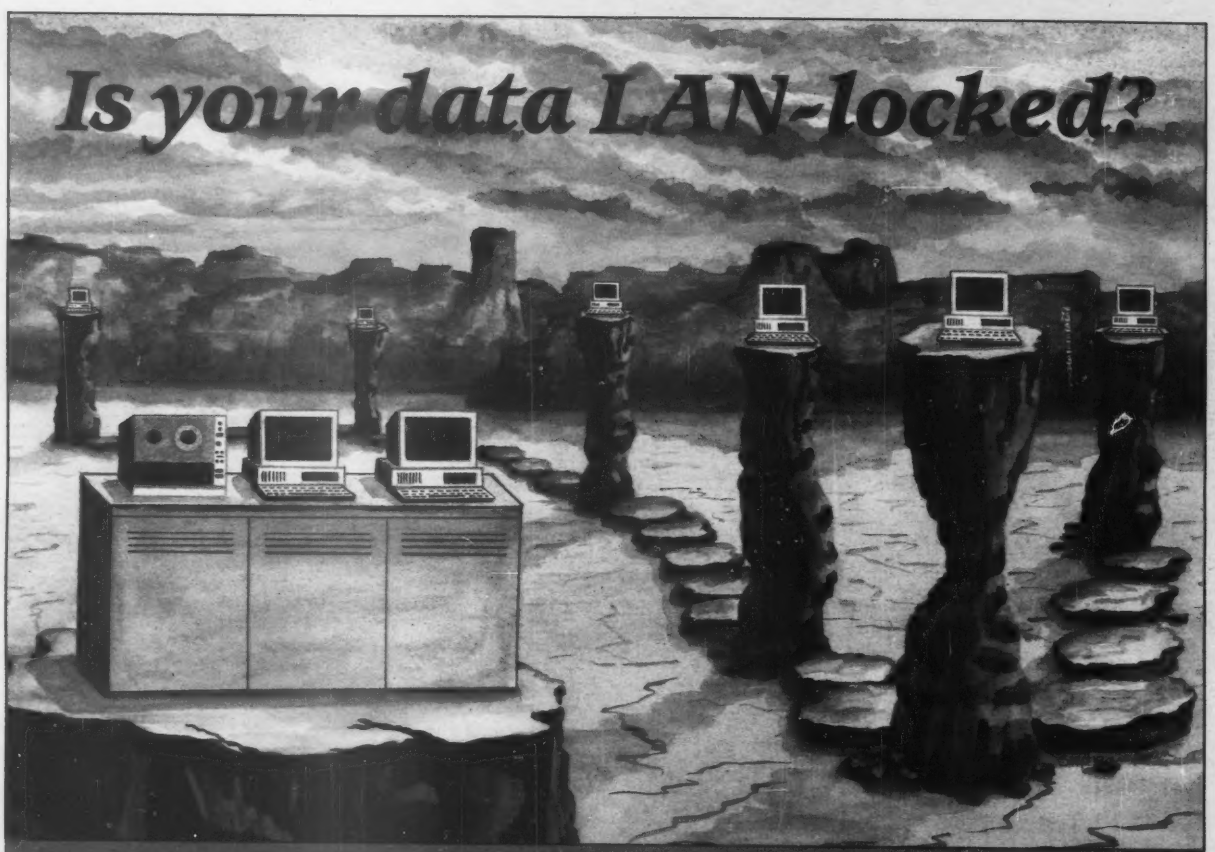

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news & analysis

UPDATE

NSF links supercomputers

Supercomputing has led to a super network for the National Science Foundation (NSF) in Washington, D.C. In late 1983, when the NSF began its supercomputer initiative to fund six supercomputing centers in the U.S. (see chart this page), it realized the need to network these centers, according to Dan Van Bellegham, associate program manager for the NSF network, called NSFnet.

"In the past, researchers who needed to access a supercomputer had to fly to the computer site and bring a tape to run," Van Bellegham explains. With the six centers and AT&T's Dataphone Digital Service (DDS) 56K-bit network in place to connect them, schools and research centers can network into the backbone to communicate with any of the six centers.

And many universities have done just that. Eight regional consortiums representing more than 150 universities have implemented or are in the process of implementing networks that connect into NSFnet. The NSF has awarded each of these consortiums between $300,000 and $1 million to help support the projects, Van Bellegham notes.

To keep the NSF networking scheme simple, the foundation chose AT&T's DDS as a backbone for a packet-switching network. "Using packet switching allows regional lines to route to a central regional center," Van Bellegham explains. "That center ties into one of the supercomputing centers and from there the data can go to any other computer on the network." Using this scheme means that universities do not have to finance communications lines to every supercomputer center, he says.

More importantly, the network is breaking down logistical barriers. "The network allows researchers to collaborate with each other and disseminate information much more quickly," Van Bellegham says.

Communications execs: Beware of wild boars

From the beginning of computing, animals have plagued information processing systems. In fact, the first "bug" discovered by computing veteran Grace Hopper actually was a moth that had entangled itself in the electromechanical relay of the ENIAC machine, notes Ira Cotton, a principal at Booz, Allen & Hamilton, Inc. of Bethesda, Md.

However, creature concerns are not limited to computers, Cotton warns. "Managers have to think about protecting their communications systems from external threats." Rodents or insects can destroy cable by chewing on it, he notes. Although such animals probably will not cause the damage in a single day, Cotton says, "they may attack [the cable] or cause it to deteriorate over time."

Larger animals can uproot cables that are not deeply entrenched, Cotton cautions. For example, he says, "a wild boar used its tusks to uproot cable at the Kennedy Space Center." Such attacks can lead to delayed or interrupted signals and electrical shortages.

There is no single rule of thumb for protecting cable from animals, Cotton says. "Managers just need to understand the cabling scheme and examine potential environmental threats."

For example, in populated areas, the biggest threat to trenched cables is people. "Post your cable on surveyor maps, and put up notices to warn anyone who is considering digging there," he suggests.

Unpopulated areas usually require shallower trenches, Cotton notes, unless there is abundant wildlife nearby. Other precautions include providing an extra-durable sheath for better insulated cable and regularly examining it for damage, he adds.

FCC may charge networks with phone line access fee

A new Federal Communications Commission proposal may spell trouble for on-line data base services such as Compuserve, Inc. and time-sharing firms such as Tymnet/McDonnell Douglas Network Systems Co.

The FCC proposal would

Continued on page 15

National knowledge network

National Science Foundation backbone net links six U.S. supercomputer centers

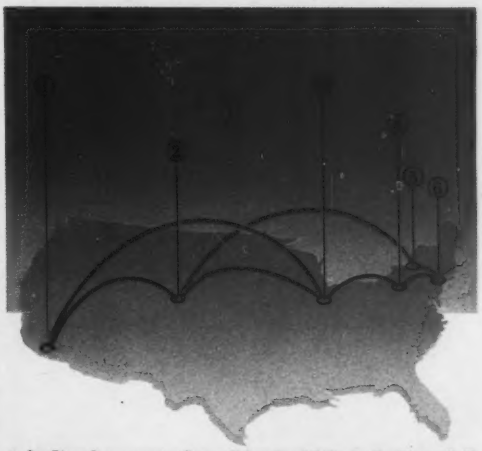

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CHART BY BRUCE SANDERS

ISDN's fortunes may be changing for the better

Integrated Services Digital Networks (ISDN) are coming, although in many respects they still resemble the character in the "L'il Abner" cartoon strip who couldn't shake his cloud.

In recent years, ISDN's cloud has been lined more with controversy than silver. Born in a Europe conditioned to government involvement in the marketplace and where standards committees can throw around a lot of weight, ISDN has found a rough reception in the U.S., one marked by indifference and skepticism.

But that situation might be turning around. Because of some well-publicized ISDN pilot installations in the past few years — most notably the one for McDonald's Corp.'s headquarters in Oak Brook, Ill. — as well as backing from AT&T, ISDN has become more legitimate as an integrator of communications services. This trend is furthered by the apparent user climate of frustration and confusion caused by the sheer numbers of telecommunications vendors and services available.

"I think there has been a change in perception in the U.S. toward ISDN compared with a year ago," claims Victor Krueger, a vice-president in the telecommunications industry services division of San Jose, Calif.-based market research firm Dataquest, Inc.

"Indifference is being replaced by a closer look at more pragmatic issues. The success of field trials has drawn attention to what ISDN can do. More telecom equipment vendors are now concerned about how they will provide ISDN, how they will maintain it and what the costs will be. There is a lot of activity from people like AT&T, Northern

Continued on page 12

The executive information system networking trend, page 13.

ISDN's fortunes

Continued from page 11

Telecom, Inc., Harris Corp. and others about how they will get their non-ISDN terminals and other equipment to work with the ISDN standard," Krueger says.

IBM should provide another boost for ISDN. Although the company is a member of the Corporation for Open Systems, it has been very sketchy and noncommittal about its support of ISDN.

And for good reason. IBM's Systems Network Architecture (SNA) is the de facto standard in corporate mainframe networking, and at certain protocol levels it would clash directly with ISDN.

Krueger says not to worry.

"It's been played up too much as an either-or situation — either ISDN survives or SNA survives, but they cannot live together," Krueger says. "That is not going to happen. ISDN and SNA are truly incompatible only at the bottom three layers of the [International Standards Organization's] Open Systems Interconnect model.

"And IBM is practical," Krueger continues. "If there is enough ISDN interest from [IBM] users, the firm will support it and help third-party vendors develop links between SNA and ISDN," he says.

That user interest must indeed be evident to IBM, Krueger suggests, because one of IBM's top executives in the communications products area recently declared at a Dataquest forum that IBM would now fully commit itself to ISDN.

Krueger adds that he is expecting AT&T to announce tariff rates for ISDN services by the end of this year, followed by similar news from the regional holding companies in 1988.

"There's still a great deal to sort out with ISDN services, however. Will there be 800 service, direct in-dialing and packet switching?" he asks. "And at what bit rates and prices? When the users see these things finalized, there will be more money going into ISDN."

Maybe, but not from everyone.

"Don't hold your breath for ISDN connections. ISDN as the do-everything, be-everything communications facility was a fantasy from the start and will always be a fantasy. One size doesn't fit all, and one way of handling data communications isn't the best," concludes Will Zachmann, vice-president of research at International Data Corp., a market research firm in Framingham, Mass. — SK

dB

By Rich Tennant

Distribution channels change face of LAN market

Could 1986 have finally been the year of the local-area network (LAN)? The answer appears to be yes. The tally is complete, and the figures seem to indicate that LANs were soaring last year.

"In 1986, the U.S. LAN market reached $1 billion in equipment and services," says Bill Redman, program director for local-area communications services at Gartner Group, Inc., a market research firm in Stamford, Conn.

As it grows, this burgeoning LAN market has been undergoing other changes. Distribution channels are being redefined, and there are new market players. Few would have guessed a couple of years ago that retail chains such as Computerland Corp. and Businessland, Inc. would be getting deeper into the LAN game.

Not total LAN integrators

"Retail chains are going to be selling more LAN add-in boards and competing directly with the smaller OEMs who can package smaller LANs for customers," Redman says. "[Both providers] are not going to become total LAN integrators, but they will provide 'subnet' services that the larger LAN vendors pass up. You have to sell customers on connectivity now, not just stand-alone systems."

There is a bigger LAN market forming that larger LAN OEMs and value-added resellers (VAR) are targeting. In the past few years, the LAN industry has been turned on its head. Instead of the large 50 or more user departmental LANs predicted to be the standard in corporate America, small LANs with 10 or fewer users and subnets, or LANs consisting of fewer than five or six people, are the reality.

However, the call for connectivity has been growing, and that call means "LANs are not local anymore," Redman says.

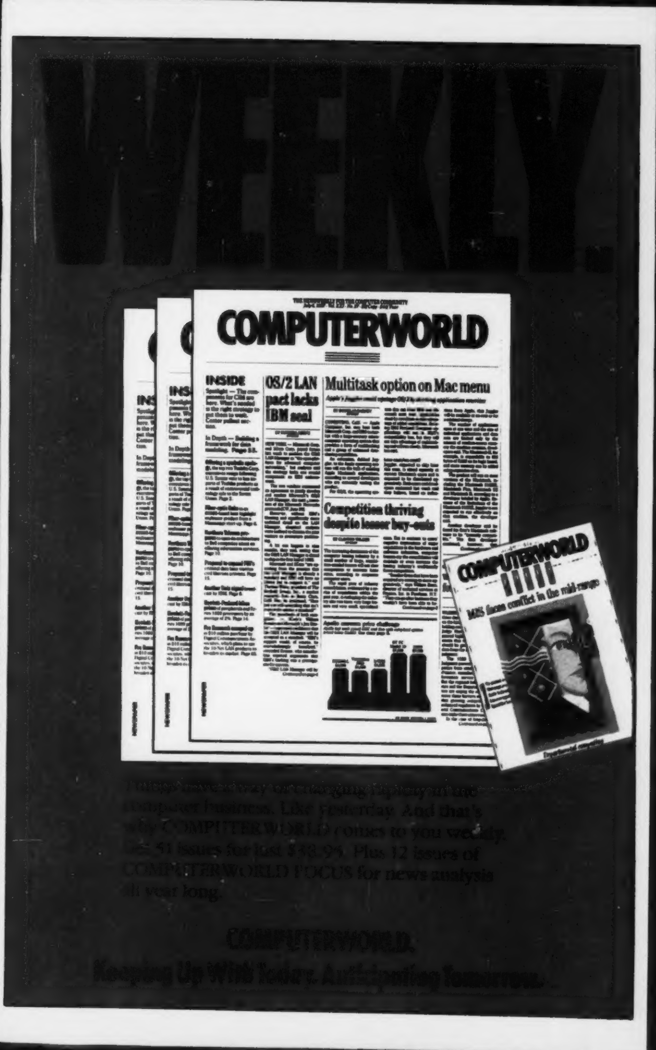
The big payoff could come in vertical connectivity. At this point, there are not enough vendors providing gateways into other networks.

"But there are other opportunities for LAN VARs," says Andrea McCurdy, a research analyst at Boston-based research firm The Yankee Group. "Users are demanding a lot more from network software, and many LAN vendors simply can't provide all the pieces. LAN VARs can give equipment integration, vertical software and a more customized end product. I think there will be an increasing dependence on LAN VARs."

Anne Ferrier, senior systems analyst at Sovereign Financial Corp., located in Norfolk, Va., says her company brought a VAR in to handle a LAN installation running Novell, Inc.'s Netware operating system. Sovereign chose the VAR because it could provide the necessary vertical accounting software and could also take care of the installation.

Ferrier says that IBM set up Sovereign's IBM Token-Ring network and AT&T installed its Starlan network at the organization, but the growing third-party activity surrounding Netware made it easy to get help from an outside VAR.

"OEMs and retail outlets are still the primary vehicles for getting LAN services and value added to users," Redman says. "But VARs are coming on." — SK



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Networked EIS expedite group decision making

An enormous amount of software wizardry goes into executive information systems (EIS). The software remains hidden from executive eyes, working within EIS to pull, sift and sculpt many levels of data to create the kind of polished graphs that top-level executives demand from just one or two keystrokes.

That same software is finding its way onto EIS networks, which are now playing a bigger role in the EIS market.

"Networking is becoming a bigger issue in EIS because the important EIS ability to handle group decision making in corporations can be expedited through networking," explains Ted Jastrzembski, director of the software and services information program at Framingham, Mass.-based market research firm International Data Corp.

The fact that EIS are moving beyond the first stage of automating just the top tier of executives and are entering their second stage of evolution is also bringing networking and EIS closer together, Jastrzembski says. "The second stage is expanding EIS to tie in management at the corporation's midsection," he says. "It's beginning to look more like a pyramid structure."

In some cases, this top-down EIS approach is starting to merge with office automation systems, Jastrzembski adds.

"This second stage means that instead of the original four or five executives on an EIS, there is now a whole new set of management users with different needs. Managers need analysis capability [from the system]; executives don't. Executives just use the system for accessing corporate status reports," Jastrzembski says.

The top-down form of EIS can be seen at Atlanta-based Georgia Power Co., a subsidiary of The Southern Co.

Georgia Power has 120 executives and managers hooked into an IBM PC Network running Cadet EIS. Cadet is marketed by Southern Electric International, Inc., which is also a subsidiary of The Southern Co.

Cadet originally was conceived, programmed and installed by MIS at Georgia Power so that a few top-level executives could receive status reports and graphs.

"We put [the EIS] on a local-area network because it's fast," explains Ben McGimsey, supervisor of client services at Georgia Power. "We also knew that executives would not use micro-to-mainframe links. There had to be good response time [under one second,] ease of use and good software or else they wouldn't use it. We felt we could put all that on a local-area network," he explains.

Using IBM Personal Computer ATs as file servers, the Cadet installation has spread to include lower level managers who require different types of information from the system.

"They do more data analysis," McGimsey says. "We're going to put in some micro-to-mainframe links. These guys will use them."

McGimsey adds that the lower level managers will also want electronic mail, unlike top executives. "No matter how much new information goes on-line on the system," McGimsey says, "we have to keep it simple for top executives. If these guys want to discuss something with each other, they pick up the phone; they don't use E-mail."

Ron Ferrero, manager of personal computer applications at Southern Electric, claims Cadet drew so much interest from other firms they decided to spin the product off and market it jointly with Arthur Young, targeting Fortune 1,000 customers.

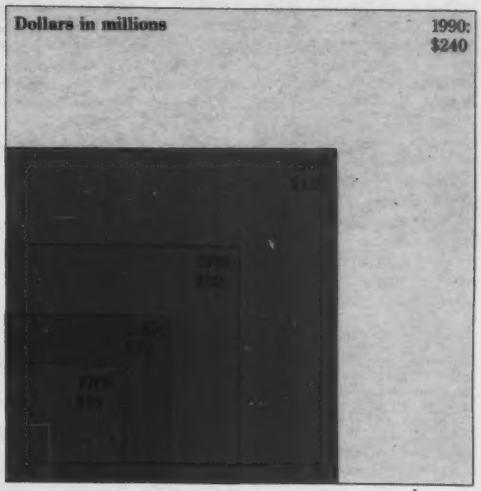
"Cadet runs on Ethernet. It can be stand-alone. We can plug Cadet into the IBM mainframe environment, into [Digital Equipment Corp.] VAX systems and into DEC's All-In-1 office system," Ferrero says. "But I think putting it on a network works best because it can distribute information quickly."

Other leading EIS vendors such as Comshare, Inc. and Thorn EMI Technology, Inc. are also reportedly planning to strengthen their EIS networking offerings.

"I think EIS vendors are realizing just how important networking will be in bringing EIS into its second stage," Jastrzembski says. — SK

EIS explosion

U.S. revenues expected to double each year to 1990



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

Apple Macintosh to run as node on Decnet LAN

Dove, Technology Concepts form joint venture

A joint marketing venture between two small companies could have a lasting impact on the data communications industry.

This year, Dove Computer Corp. of Wilmington, N.C., and Technology Concepts, Inc. of Sudbury, Mass., will beta-test an as-yet-unnamed product that reportedly will allow the Apple Computer, Inc. Macintosh to run as a node on Digital Equipment Corp.'s Decnet local-area network (LAN).

Technology Concepts will supply the software — a version of the company's Community LAN — while Dove will provide the Ethernet controller hardware, an attached peripheral known as Fastnet. Officers of both firms say the pricing will be in the neighborhood of $500 for Fastnet and $900 for the software.

What gives the agreement an importance far beyond that of the DEC and Apple worlds is Technology Concepts' ownership and the third-party use of its Community products. Technology Concepts was founded by Stuart Wecker, one of the principal architects of Decnet. Late last year, Philadelphia-based Bell Atlantic Corp. bought Technology Concepts. The purchase of the company could signal a direction for Bell Atlantic's development efforts to produce a common software environment for the organization's voice and data transmission operations.

Turning the tide

Bell Atlantic, as with all the regional holding companies, exited the breakup of AT&T without a research and development department because Bell Laboratories went with the parent company.

However, the regional holding companies have set out to change that situation. They have, for instance, jointly funded an R&D consortium. And, individually, they have all been acquiring small to medium-size communications-related companies. In effect, they are building their own Bell Labs piece by piece.

Since Bell Atlantic bought Technology Concepts, the Community product has been used within Bell Atlantic, although company officials decline to say for what purpose.

Meanwhile, Community is being sold under various private labels by several major computer vendors.

Sun Microsystems, Inc., for instance, markets the product as Sunlink DNI to those customers who want their Sun workstations to function in a DEC environment. Technology Concepts hints that similar agreements are in the making with other vendors of Unix-based workstations.

Dove Computer is a company of approximately 25 employees that got its start two years ago. The company's founders' intent was to enter the Macintosh and IBM Personal Computer aftermarkets.

However, as the company developed, it found the Macintosh market alone was rewarding enough. With the introduction of the new generation of Macintosh machines this year, Dove abandoned the PC for Apple products.

From 1985 to 1986, Dove was working with a major customer, which Dove declines to name, that wanted to link Macintosh machines with DEC products. The customer had heard of Community and arranged a meeting between Dove and Technology Concepts.

At that time, Technology Concepts was marketing Community for Unix systems and PCs. Discussion between the two firms resulted in the Community product for the Mac as well as a joint marketing agreement.

Community for the Mac is expected to ship by December of this year. — MT

The industry's urge to merge

Merge! Acquire! Consolidate! These are the battle cries resounding throughout the communications market. Within the last several months, vendors have been joining or consuming their competitors and cohorts in an attempt to become bigger, better and more diverse.

The economy has been a primary motivator behind this activity, claims Bob Newton, vice-president of telecommunications consulting for Gartner Group, Inc., a Stamford, Conn., research company. "Narrowing profit margins are driving the weaker players out of business or into consolidation," he says. "We've seen it in banking, manufacturing and marketing. The computer and communications industries have just joined the trend later."

Competition is another factor. Communications vendors make most of their revenues and profits from electronic hardware, Newton comments. "The hardware arena has become extremely competitive." Some of the competition comes from foreign vendors joining the market, but another aspect is the maturation of the communications industry, he says.

No room for small players

Particularly with digital communications technology, there was a tremendous latent demand in the early years of the industry, Newton recalls. This left room in the market for many players. "Some portion of that latent demand has been sated today," he says. "The market is not growing the way it was. There is no room for very small players to grow."

The market has also become more stable, Newton says. And that stability has attracted large players such as AT&T, IBM and Digital Equipment Corp. As a result, small companies are forming alliances in order to compete with these bigger opponents, he explains. "Network communications vendors have to reach about $100 million to gain the critical mass to compete with vendors such as IBM," Newton reports.

These smaller companies have a fairly short amount of time in which to create that critical mass, so many are turning to consolidation. "In a few years, the market may jell down to five or six major companies worth $100 million to $300 million," Newton suggests.

Most companies merge to expand. However, while some companies are seeking to extend their current product focus with related offerings, others are seeking to add diverse or complementary products and become a one-stop shop.

Digital Communications Associates, Inc. (DCA), which has acquired four companies in the last 18 months, is well on its way to becoming a one-stop shop. "DCA wants to be a complete data communications player," affirms Brad Baldwin, a networking industry analyst for San Jose, Calif.-based research firm Dataquest, Inc.

DCA originally concentrated on the low end of the communications market with its Irma IBM 3270 emulation products. It has since acquired companies that extend this low-end market focus, including San Jose, Calif.-based Forte Communications, Inc., which produces personal computers and communications products; Microstuf, Inc., which produces Crosstalk PC communications software; and most recently, Fox Research, Inc., which produces the 10-Net local networking line.

In addition, DCA has acquired Cohesive Network Corp., which produces T1 multiplexers, Baldwin notes. "The T1 multiplexers address the high-end wide-area networking market and complement DCA's local networking products," he says.

By contrast, the merging of 3Com Corp. of Santa Clara, Calif., and Bridge Communications, Inc. of Mountain View, Calif., will allow the companies to strengthen an already existing relationship. Bridge has been using 3Com's boards in its own products through an original equipment manufacturer's deal with 3Com, Baldwin notes.

Although they use similar equipment, the two vendors target different niches of the communications market. 3Com specializes in networking products for PCs. Bridge focuses on products that connect terminals to minicomputers and mainframes. With the merger, the two companies can share software source code and develop a greater level of integration between the products, Baldwin says. "Before merging, they could not divulge that code," he says.

The greatest impact of these mergers will fall on vendors, Newton says. However, users will feel some effects as well. The benefit is that users should gain better integrated products, Baldwin claims. The drawback is that the falling costs of networking equipment will level off.

"The price of hardware has been coming down at a phenomenal rate — about 20% per annum," Newton says. "As vendors consolidate and stabilize, they will arrive at reasonable price points." — RH

News section written by *Computerworld Focus* staff members Stan Kolodziej, Michael Tucker and Rebecca Hurst.

Update

Continued from page 11

require computer networks linking into rented private telephone lines to pay an access fee of up to $5 an hour per user as of Jan. 1, 1988.

The commission states that because network firms are currently exempt from access charges, they are being subsidized by business and home users. Companies like Compuserve and Tymnet/McDonnell Douglas argue that they may have to pass the costs on to users. They also claim that the plan gives companies that maintain their own networks an unfair advantage because these firms would not be required to pay the access charge.

The FCC is seeking comments on the proposal.

COS finds it hard to escape criticism on membership rules

The Corporation for Open Systems (COS), originally a vendor-driven standards organization, came under fire several months ago because it lacked user input. In response, COS has begun an earnest drive for user members, but the group is still being criticized.

The problem centers on COS membership requirements, says Robert Zeibig, senior manager and telecommunications practice leader at Nolan, Norton & Co., a Lexington, Mass.-based management consulting firm. The full-membership fee, which starts at $25,000 and requires several hours of employee time, is too high a price for users, he says. "Vendors can justify these expenditures as development costs," Newton remarks. "Users don't have similar justifications."

COS responded to the problem in January by developing an affiliate membership. Affiliate members pay only a $500 annual fee. However, these members cannot vote nor can they attend COS's bimonthly strategy sessions or user committee meetings.

To encourage greater participation, COS may need to reevaluate its requirements and devise a new category of membership with voting powers, Zeibig says. "Users need to have direct input into COS and the standards it is making. They shouldn't have to choose from whatever standards have fallen out," he says.

The vendor members of COS will benefit as well, Zeibig notes. "Vendors need to understand more accurately about real users' needs rather than perceived needs." — RH

Corporate nod boosts E-mail

After years of struggling for acceptance, electronic mail has begun its ascent to stardom.

Long credited with speed, convenience and cost-effectiveness, E-mail has finally gained acceptance among corporations this year, reports Barry Bartlett, a senior analyst for Market Intelligence Research Co. in Mountain View, Calif. This acceptance will contribute to a growth in revenue from less than $700 million in 1986 to $1.9 billion in 1992, a Market Intelligence study forecasts.

Predictions for E-mail are similarly optimistic at San Jose, Calif.-based research firm Dataquest, Inc., which forecasts a 50% compound annual growth rate during the next four years. Like Market Intelligence, Dataquest attributes this growth, in part, to corporate acceptance.

"One of the biggest driving forces in electronic mail is corporate culture," says Krystyna Filistowicz, a research analyst for Dataquest's Office Systems Industry Service. Without pressure from top management, users tend to ignore the E-mail functions available to them, she notes.

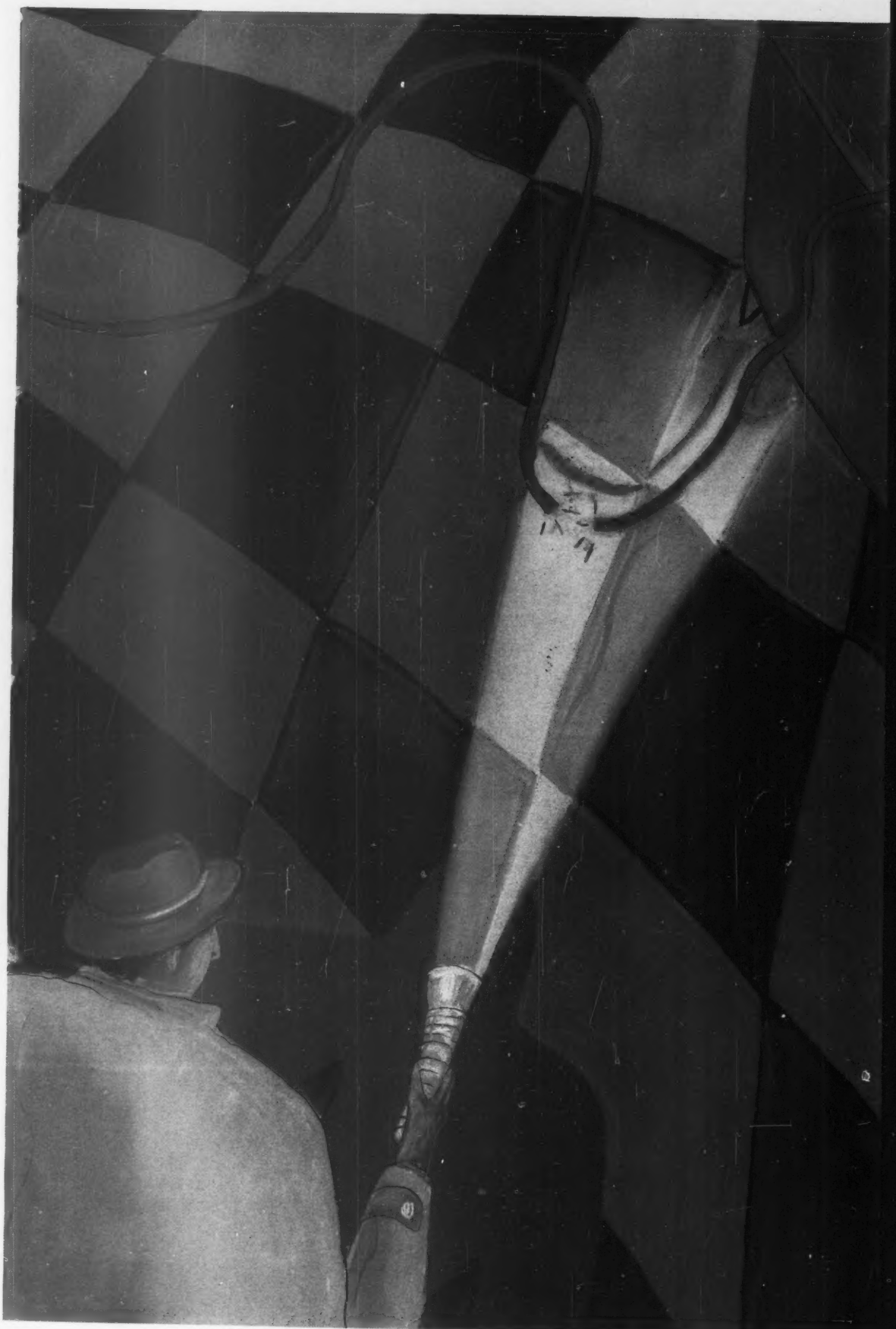
Everyone clamored for E-mail

For example, a large vendor that had been offering E-mail for years did not use it internally, Filistowicz recalls. "Then top-level managers began to communicate with E-mail, and everyone below began clamoring to get onto the network," she explains.

Another factor contributing to user acceptance is ease of use, according to Douglas Bott, vice-president of information systems for the Continental Illinois Bank & Trust of Chicago. Because Continental is a paper-based operation, Bott's group made E-mail more attractive to users by reproducing paper forms electronically. In this way, he says, users could work with a familiar format.

Electronic Form Systems, located in Carrollton, Texas, has taken the idea of electronic versions of forms and translated it into a general-purpose product called E-Form. The product contains predefined field attributes to help users create forms. Also, in places where the same data appears more than once, E-Form reportedly distributes the data into appropriate fields. The product runs on IBM Personal Computers, PC XTs and ATs and compatibles. Market Intelligence's Bartlett predicts that the electronic forms field will be a fast-growth area in three to five years.

Communications standards such as X.25 and X.400 will also boost E-mail acceptance in upcoming years, Bartlett and Filistowicz agree. "A major problem has been that different E-mail systems cannot talk to one another," Dataquest's Filistowicz claims. — RH



The case for network management

BY STAN KOLODZIEJ

It's too bad, but data communications users are paying the penalty. Through the years, as users pushed vendors to supply networking solutions, data communications vendors willingly complied. But with few guiding standards in place, vendors became their own standard bearers. The result: multivendor networks, multiple protocols, proprietary equipment and a number of frustrated customers. But this situation makes for steady business for network management system vendors.

"Networks have tended to evolve over time without much planning," explains Scott McCready, senior industry analyst at CAP International, Inc., a Marshfield, Mass., research firm. "Most networks have been put in place as a reaction by users, without concern for future problems."

Those problems have reached the boiling point recently. As computers and networks become integrated, the series of protocols and proprietary devices found in each world have proved difficult to meld into coherent units. Protocol conversion across multivendor, dial-up lines is still cumbersome, slow and expensive, causing a great amount of software overhead. The same is true of network gateways and bridges, which act as go-betweens for networks and use different transmission techniques — such as carrier-sense multiple access with collision detect and token ring — or different media, such as broadband and baseband. Connectivity can be accomplished, but at a steep price.

With the push for networking connectivity, "there soon will be a point when the term 'local networking' will be outdated," claims Steve Price, data communications engineer at the Lyndon B. Johnson Space Center in Houston. "Networking expansion will be transparent across lines."

If Price is right, there is also a flip side to that expansion: control.

"Users want more centralized network control," McCready explains. "But people are becoming concerned with the number of protocols blocking that way. There's a dilemma. Because nobody knows the solution to network problems, vendors can't build products to match it."

A dilemma, indeed. That quest for control is why network management systems sales are on a roll.

Network management systems can do many things, but, in essence, they act as network traffic cops. Most systems integrate several important control features, such as a facility for defining alarm conditions, polling the network for alarm conditions and initiating procedures to restore a network in the event of failure.

Reacting to competitive pressure to consolidate as many net control functions as possible under one roof, more network management systems are also integrating performance measurement services — such as network monitoring of response times and traffic flow — and testing features, such as bit error-rate, loop-back and trouble-ticket reporting with summaries. (Trouble tickets enable network operators to log and track network outages.)

According to International Data Corp. (IDC), a Framingham, Mass.-based research group, network management systems, like most other technologies, have experienced growing pains.

In the beginning there was modem control, the first type of network management, which evolved in the 1970s. Early, intelligent modems containing some built-in diagnostics were used for basic network testing. Control was localized on each system.

The second stage came with the debut of centralized control systems, precursors to today's full-blown network management systems. Centralized modem control enabled users to monitor an entire network from a single location, possibly from a single terminal. Centralized control was expanding, and audio and

Kolodziej is *Computerworld Focus*'s senior editor.

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visual prompts helped alert operators to network problems. Printers reported network status. From a central location, users could also conduct such remote-line diagnostics as bit error-rate and loop-back tests.

Building on this base, many network management systems now provide the ability for network operators situated at central sites to actually reconfigure networks, something that until recently was done manually. Such systems can phase out a faulty modem or bypass a bad line. It's apparent that such services are going to pay their own way many times over by preventing network downtime and frustration.

And that's not all that is coming down the line. The software embedded in network management systems is becoming more versatile and programmable. There will soon be a push for systems that can channel network status data directly into the data bases of mainframes, or even personal computers, thus bypassing the bundles of hard-copy printouts typically produced by current net management systems.

"After a point it becomes too much to scan status reports in hard copy," Johnson Space Center's Price explains. He adds that Racal-Vadic, Inc., a San Jose, Calif.-based supplier of the space center's MDS-II network management system, has told him it will soon offer an interface that will move the data directly into personal computers. Programmable software riding on a network management system means that an operator with some programming know-how will be able to configure the management system to monitor only certain parts of a network at certain times, tailor report generation output, customize network alarm outputs to be visual or audio and so on.

It all sounds impressive, but not all network management system users are happy.

John McFarlane is an international gateway operations system engineer at Telenet Communications Corp., an international telecommunications carrier located in Reston, Va. McFarlane is in charge of monitoring five packet-switching sites, totaling about 100 switching circuits. McFarlane uses the Network Analysis and Management System (NAMS) from Digilog, Inc. of Montgomeryville, Pa., to monitor the circuits remotely. More Digilog systems are being used at other Telenet switching sites in the U.S.

"A big part of my job is to bring in network management systems, take them apart and find out what's wrong with them," McFarlane explains. "When I first brought the Digilog system in, I found eight or nine [software] bugs. From there, I worked closely with Digilog to help improve NAMS.

"I think the systems have changed a lot in the past two years," McFarlane adds. "They've gotten better. The fact is, the Digilog system was the only one on the market at the time that seemed to do the job. Even so, it needed work."

Some users are finding they don't need all of network management systems' bells and whistles. Despite NAMS's improvements, McFarlane says that he only uses part of the management features available with Digilog's system.

"We use [NAMS] mainly for circuit troubleshooting," he explains, "but for actual management functions, the system just isn't enough. We use other devices to handle bit error-rate testing and other means of pinpointing problems on the line. You have to know how to use the system, how to read it and how to use it in conjunction with trouble-ticket reporting and so on. All these things go into managing the network, and that's not that easy to do."

Price, like McFarlane, says the space center selected its network management system because, at the time, the MDS-II was the only modem pool management system that could do the job.

According to Price, the Johnson Space Center's 256 modems represent the world's largest centralized pool of modems.

A telecom manager at a large Southeastern telecommunications carrier says it would be nice if the diagnostics software on his network management system could be customized a bit. "Some of our operators are programmers, and they feel they can improve some points in the system," he says.

> **"As a marketing strategy, Netview is great for IBM; as a tool, Netview is still limited. With Netview, IBM has driven network management into the ground of MIS and declared that it will fly on the MIS mainframe [but] not in telecommunications management."**
>
> JACK MUSGROVE
> DATAQUEST, INC.

Not only is the user's search for simpler connectivity forcing suppliers to provide better solutions, but it is also making the vendors rethink some tried-and-true marketing ploys. Previously, many communications companies could coerce customers into remaining with their networking equipment. For most vendors, however, those days are dying.

"Vendors would sell corporations a lot of equipment that couldn't be expanded or wouldn't operate unless you purchased some more proprietary components from them," analyst McCready explains. "If you purchased, say, 20% of your equipment from one vendor, you were probably going to buy more from that vendor. The proprietary route was a good way of locking customers in. It was a good way to leverage sales."

The push for vendor loyalty as well as the lack of industry-wide standards has made for an odd melange of equipment and transmission software in user corporations. In the computer market, although IBM's monolithic presence has been a bane to some, its preeminence has provided a stabilizing element that has helped much of the industry thrive and progress.

On the other hand, there is little stability in the data communications market, especially since AT&T's divestiture. Unlike IBM, there were few market leaders, AT&T included, that could impose standards on the data communications industry. Instead, committees usher in official standards from the outside. This standards-making process is not without its problems; standards, for example, may still conflict with each other.

"I don't think anyone knows where the networking market is heading. It's changing so quickly," says Ray Grenier, product marketing manager for network management and services at Digital Equipment Corp. in Maynard, Mass.

"DEC sees networking expanding over a horizontal plane in clusters, but we offer both centralized and distributed networking. There are certain products that we can't ignore, such as [IBM's Systems Network Architecture (SNA)], but we also support the International Standards Organization protocols. We have to. Vendors have to give options," he says.

Superimposed on the official standards, however, and coming more into focus are the market standards that IBM has been slowly building.

In the mainframe area, SNA will be a formidable roadblock for Integrated Services Digital Network's drive for U.S. market share. IBM's Netbios is becoming a de facto protocol with local-area network (LAN) vendors.

In addition, IBM's Netview management system is slowly picking up speed and gaining vendor adherence. Ironically, Netview might be more important in the long run not for its network management capabilities but rather for what it represents.

Netview not great

"Netview is not a great product, but it's being enhanced," CAP's McCready says. "Originally, it was more suitable for controlling PC products, but now, by setting a [market] standard, more vendors will build interfaces to it that will allow users to cut through different layers of networking and handle deeper management functions."

McCready adds that Netview will provide a more centralized approach that will enable a firm to handle diagnostics and troubleshooting — from a distance.

"One of the biggest problems in network management today is trying to manage local-area networks from a location outside the network," McCready claims. "To monitor LANs, you now have to have the monitor sit right on the local network. It has to be physically close; otherwise, it just can't cut through the layers of networking protocol to do anything really useful. That doesn't give the kind of centralized control that users now want."

Although it does make for a brisk market in LAN management systems, most network management system software on LAN file servers is weak, giving only some network security and minor diagnostics capabilities.

"You have to remember, however, that network management capabilities at this level are usually built around the primary tasks of building a gateway, server or controller and providing things like file transfer and document translation," explains Robert Philips, a senior engineer at Fremont, Calif.-based Interlink Computer Sciences, Inc. "Network management features are just coming into their own at this level."

DEC's Grenier agrees. "We're going to try and make it easier for our users to expand into T1 lines and other types of broader networking, though LANs as a rule don't tend to see the performance problems that enterprisewide networks do. To begin with, LANs only use about 20% to 25% of their bandwidth capacity. There is a great need to keep certain LANs closely monitored and running, such as those in manufacturing, but many other LANs are not as crucial," he says.

IBM software push

Nevertheless, Netview could help make any point on networks open to the scrutiny of network management. Netview is part of IBM's strategic software push accompanying its 370 line, which it is now extending further into the reaches of departmental computing with its 9370 computers. Netview/PC is an extension of Netview that supports IBM Token-Ring, non-SNA and non-IBM communications devices.

It is important to note that both Netview and Netview/PC are part of IBM's Systems Application Architecture, a framework that will bridge several of IBM's systems and keep program interfaces consistent. What that means in market terms is a more homogeneous set of networks, big and small, carrying applications that will work closely together. In most of today's networking environments, that is wishful thinking.

"As a marketing strategy, Netview is great for IBM; as a tool, Netview is still limited," claims Jack Musgrove, associate director of telecommunications at Dataquest, Inc., a market research firm in San Jose. "With Netview, IBM has driven network management into the ground of MIS and declared that it will fly on the MIS mainframe [but] not in telecommunications management," he says.

"Users see Netview as a positive way to finally do away with a fragmentary IBM computer networking environment," Musgrove adds. "As a management tool, however, it has to be able to go out and do things like fault isolation on long-distance lines. That means Netview will have to work with individual network management systems already out there."

The competition's help

To accomplish this task, Musgrove says, IBM will require the cooperation and support of current network management system vendors. "But I don't see carriers like AT&T and the others supporting Netview for some time because of competitive reasons," he says.

However, Netview is starting to gather some market momentum behind third-party vendors of network management systems. Influential networking players — such as Ungermann-Bass, Inc., Timeplex, Inc., Racal-Vadic and MCI Communications Corp. — have designed products around Netview, and other vendors have expressed similar interests.

Netview also brings up an interesting management issue. IBM has structured Netview to place more network control in the hands of MIS. Will this lead to conflict between MIS and telecommunications managers?

"Not likely," Musgrove says. "Both MIS and telecom will be integrated under the corporate chief information officer soon, anyway. The question of control won't matter." ❖

Sheer power!

The coming force of 80386 servers

BY MICHAEL D. MILLIKIN

Since its introduction some 18 months ago, the Intel Corp. 80386 has excited the industry. Workstation developers see the chip as a powerful, inexpensive 32-bit computing platform that taps into both the Microsoft Corp. MS-DOS and Unix worlds. Artificial intelligence developers see the product as a processor with the horsepower, address space and price to carry their applications to a much broader market. Network vendors see the microprocessor as the chip at the heart of communications and network servers that will soon challenge vendors such as Digital Equipment Corp.

Indeed, for general office applications, the 80386 will find its most widespread application for the near term in network servers. Most certainly, there will be those power users and professionals who want an 80386 workstation on their desks as well as some value-added resellers, who will find that the 80386 provides a good Unix platform; but for the next few years, Intel 80286 workstations and network stations will satisfy the needs of most users.

A network of personal computers and network stations using dedicated and nondedicated 386 servers can potentially rival or surpass the networked work group solutions that use proprietary minis as servers.

In terms of raw power, for example, the 20-MHz 80386 is conservatively rated at 5 million instructions per second (MIPS) — a higher rating than that of the DEC VAX 8600 or the IBM 4381. Even the expected Microvax III chip set

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is rumored to run at approximately 2.5 MIPS — fully half the power of the current 386s.

Of course, a system and a server require more hardware than just a CPU. To flesh out its 32-bit computing platform, Intel recently added three other processors to the family founded by the 80386: the 80387, the 82380 and the 82385.

The 80387 numeric coprocessor reportedly boosts performance of numeric applications by a factor of four to six times. A natural add-on to the line, the 387 is compatible with software written for its coprocessing predecessors, the Intel 80287 and 8087.

The 82380 integrated system peripheral incorporates a direct memory access controller that can use the entire 32-bit bus bandwidth through eight independently programmable channels.

Boosting I/O speed

Intel estimates that the 82380 can increase system I/O speed by a factor of five to 10 times.

The on-chip features of the 82380 can replace 20 to 30 large-scale integration and very large-scale integration components. The 16-MHz version of the chip supports a data transfer rate of 32M byte/sec.; the 20-MHz model handles data at up to 40M byte/sec.

The 82385 cache controller is said to eliminate wait states and reduce bus access to a system's main memory.

Craig Burton of Novell, Inc. noted last December that until a bus structure can match the power of the chip, the 80386 servers will add only about 20% perceivable throughput over the 80286's performance.

But even given a bus solution that can support the 80386 and its family members (the IBM Micro Channel is a good candidate), it is clear that hardware power alone isn't the only factor in selecting a system or server nor is it even the primary factor. Systems and application software is key.

Currently, 80386 servers function primarily as either beefed up MS-DOS machines or Unix servers.

Proprietary advantage

Even with the steady ramp up in demand for PC networks, present PC solutions cannot match the level of services provided by proprietary vendors in areas such as document and library management and transparent integration with the corporate architecture. This disparity in capability between PC nets and proprietary solutions will disappear in the near future with the coming of IBM's OS/2 and Microsoft and 3Com Corp.'s MS OS/2 LAN Manager.

Because the 80386 is compatible with existing MS-DOS software, MIS can always take a 386 box and load it with server software designed for a less capable chip. That configuration does not buy much beyond a slight increase in performance.

However, several vendors, including the following, have taken a more innovative approach by using the 80386 as a Unix machine and crafting a solution around such a setup.

• **Banyan Systems, Inc.** The company's Virtual Networking System (Vines)/386 is an implementation of the International Standards Organization (ISO) Open Systems Interconnect model that runs under Unix and allows users to build large transparent multisite multiserver networks with PCs.

One additional value incorporated into Banyan Vines/386 is Streettalk, a global distributed naming system. Users can connect to remote servers without first linking up through a gateway. Because Streettalk names all objects, such as file volumes, printers and host gateways, users can access these objects using plain English such as "glass house" or "bean counters," for example. Banyan also offers centralized network management tools.

Initially, Banyan produced its own proprietary Motorola, Inc. 68000-based servers, then followed up with a software-only version of its operating system designed for the 80286. Vines/386 is a logical extension.

Vines/386 for the Compaq Computer Corp. Deskpro 386 costs $3,995.

• **Convergent Technologies, Inc.** The firm has unveiled an 80386 server configuration that could be a model for other current solutions. The Server PC uses the 20-MHz 80386 and, through Merge 386 from Locus Computing Corp., runs Ctix/386, Convergent's implementation of AT&T Unix System V Release 3, and MS-DOS simultaneously. In short, the Server PC integrates a PC server with a classic Unix multiuser system.

Convergent has been one of Banyan's primary OEMs. The Server PC offers Vines networking and supports up to 64 PCs, 32 terminals or a combination of both. As an example of what a vendor can build around the Intel platform, the Server PC uses an integral 64K-byte write-back cache with zero-wait states and a 32-bit data path. A small computer systems interface (SCSI) controller offers a 5M byte/sec. data rate. Two optional floating-point processors, the 80387 and the Weitek Corp. 1167 provide an extra boost. Convergent rates its 386 configuration at 5.7 MIPS.

The Server PC includes 4M-byte memory, an 80M-byte disk, an IBM Personal Computer AT-style floppy and three full-height SCSI bays. The system supports the 80386's 64M-byte memory and offers disk storage up to 1G byte. Ten expansion slots offer compatibility for AT-style cards as well as special 32-bit cards. Ethernet and IBM Token-Ring networks are the first to be supported.

Dividing applications into user-workstation-resident front ends and server-resident back ends makes a great deal of sense for networks mixing MS-DOS and OS/2.

Currently offering AT&T's Remote File System under the Transmission Control Protocol/Internet Protocol, Convergent says it plans to add Sun Microsystems, Inc.'s Network File System (NFS) soon. Typical OEM pricing for the Server PC is $7,500.

Although attractive, the current 386 server solutions do not have nearly as much potential as future servers that will use OS/2 and the MS OS/2 LAN Manager.

The first releases of OS/2, the recently announced and as-yet-undelivered successor to MS-DOS, will cater to the 80286. But because of upward compatibility, the 386 will also benefit from OS/2 because it is the first mainstream MS-DOS-compatible, protected-mode operating system for the Intel family.

Aside from the OS/2's multitasking capability and ability to access vast amounts of memory, the operating system boasts Interprocess Communication (IPC) features. One of the primary attributes of OS/2 is that it is extensible and modular. The Presentation Manager, a windowing interface that will come with every release of OS/2 after Release 1.1, is one example of such an extension. IBM's own Extended Version of OS/2 is another. And the MS OS/2 LAN Manager from Microsoft and 3Com is a third.

The MS OS/2 LAN Manager offers an extension to interprocess communications across the network, support of MS-DOS 3.1 and above and OS/2 workstations on a network, improved security and administration features, remote device sharing, access to the 16M bytes of memory through OS/2 and an open architecture supporting customization.

The MS OS/2 LAN Manager will prove key to the development of the next generation of PC networks. Its chief attribute (other than resting on top of OS/2) is that it supports truly distributed applications, with front ends running on workstation clients and back ends running on servers in a PC local-area network (LAN) environment for the first time.

Current PC LAN applications run entirely on the client PC access files on the server according to MS-DOS 3.1 enforced file and record locking.

Interprocess communications

The MS OS/2 LAN Manager enables application developers to write a single version of an application that will be capable of running on a single machine or will be distributed between machines connected by the MS OS/2 LAN Manager. This action takes place via an IPC facility, which is another name for a remote procedure call (RPC). IPC is similar to but not compatible with Sun's RPC facilities. Like so many standards and interfaces in the MS-DOS and Unix worlds, this situation will take some sorting out.

As an attractive bonus, an OS/2 server will support both Microsoft Xenix and MS-DOS workstations on the same network. In other words, not everyone on the network needs to have OS/2 running on every workstation. An MS-DOS node (with the addition of some special extensions) will have access to the features of the OS/2 server.

Dividing applications into user-workstation-resident front ends and server-resident back ends makes a great deal of sense for networks mixing MS-DOS and OS/2. An Intel 8088-based PC running MS-DOS 3.1 and above will reportedly be able to take advantage of a 386-based

server running OS/2 with its protected-mode access to process queries in a fraction of the time it takes to do so locally.

Likely first distributed applications for such a PC will be data bases in which a front end on the user's PC handles query processing, forwarding queries to a central data base application running on the server. Today, multiuser data bases, like Ashton-Tate Dbase III+, process all code in the user's workstation with the server overseeing only file locking and storage.

This central data base will often be something other than a PC running OS/2. Vendors of proprietary operating systems, such as DEC's VMS and IBM's VM, as well as third-party applications can use the MS OS/2 LAN Manager to build applications using this technique. In addition to being able to coexist comfortably with Microsoft MS-Net on the same network, Xenix systems will also be able to communicate with the MS OS/2 LAN Manager.

OEMs' extended offerings

The extensibility of OS/2 and the MS OS/2 LAN Manager is significant for OEMs — especially companies such as DEC, Wang Laboratories, Inc. and Hewlett-Packard Co. In theory, a company could create its own extended version of OS/2 and the MS OS/2 LAN Manager that would tie in the OS/2 and MS-DOS network more closely with the proprietary offerings.

Wang has already taken the lead by announcing support for OS/2 before any of its traditional competitors except IBM.

IBM, interestingly, is remaining mum on the subject of MS OS/2 LAN Manager support. (To confuse things, IBM also has a LAN Manager offering, but it is completely different from the Microsoft product). IBM has yet to endorse the MS OS/2 LAN Manager, but the company has not officially spurned the product, either.

Microsoft is not going it alone with the MS OS/2 LAN Manager. 3Com and Microsoft recently formalized their codevelopment agreement for the MS OS/2 LAN Manager component of OS/2. Under the terms of the strategic partnership agreement, both companies will distribute and sell the product. Microsoft will push OEM sales. 3Com, the first OEM to sign on, will offer 3+Open, a set of network systems software based on the MS OS/2 LAN Manager, to value-added dealers.

The alliance makes sense for both parties. Microsoft may be strong as a systems vendor, but it could use some help in implementing standardized protocols. On the ISO model, the MS OS/2 LAN Manager occupies Layer 7 — the applications layer. Microsoft wants to guarantee that lower level transports conforming to the model can run beneath MS OS/2 LAN Manager without problems.

The objective of this work is to establish a de facto standard for PC networking that is consistent with the larger industry movement to standards. Indeed, 3Com President Bill Krause says that he envisions his company playing a role with MS OS/2 LAN Manager comparable to the role that Sun Microsystems played with NFS. Farfetched? Not at all.

3Com took the opportunity of the public announcement of the MS OS/2 LAN Manager venture to unveil its next-generation products: 3+Open along with a 386 upgrade for its 3Server3. Around the third quarter of next year, then, users will reportedly be able to obtain from 3Com an 80386 server with the latest and greatest in OS/2 system software.

Compared with Novell's Netware, 3Com's 3+Open is a model of openness. Nevertheless, even 3Com had to resort to a proprietary multitasking kernel to get around the restrictions of MS-DOS. Except for that one layer, however, 3Com's 3+Open uses Microsoft's server message block file protocols and the MS-DOS disk format. With 3+Open, 3Com is moving completely away from the proprietary aspects of the 3+Open networking system software.

Not an immediate solution

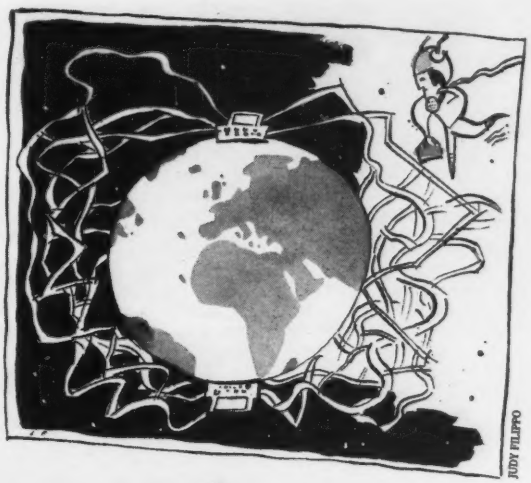
The MS OS/2 LAN Manager solution is not an immediate one. Actual products will not be out for almost a year, and the wait for extended modules that intertwine with proprietary systems will be even longer.

Nor will the MS OS/2 LAN Manager combination be a requirement for small, isolated PC networks. But this duo can theoretically provide the following:

- A standardized platform for powerful distributed applications.
- A closer interlinking of PC networks with other network architectures.
- Enhanced network gateways into other communications architectures.

There is much work to be done to make the MS OS/2 LAN Manager duo competitive with proprietary offerings. For example, the combination lacks document and library services. Forward-thinking vendors will write their own extensions that will integrate the MS OS/2 LAN Manager and the 80386 boxes into their own architectures. OS/2 will prove to be an attractive lure for third-party application developers, especially once the minicomputer vendors start supporting it with their own offerings.

Which vendors will go after this opportunity? Wang, with its early support of OS/2, may be a good bet. HP, a firm with a strong integration of HP 3000s and PCs over a network and with excellent distributed library services may be another. An aggressive move toward the MS OS/2 LAN Manager from either of these firms could present DEC with an unexpected challenge at the work group level.



Networks in a strange land

BY AVERY JENKINS

A company's quest for a functional, reliable international data network can lead it down strange paths.

Take, for example, the firm that wanted to establish a data link to its Taiwan offices. It found that the country's Postal Telephone and Telegraph (PTT) authority made it difficult to get approval, equipment and implementation of a data link between Taiwan and the U.S. So through midnight expeditions behind U.S. Customs' back, the company smuggled in modems, cabling and software to establish a surreptitious dial-up network.

Then there was the firm that built a microwave link in Mexico. After approval was granted and the site was under construction, the Mexican government told the firm to double the size of the station.

When the company had completed construction of the enlarged microwave station, the Mexican government "walked in and took over," according to a source, who wishes to remain anonymous. Officials told the manufacturer that it could use half of the station free.

Staving off acquisitive foreign governments and smuggling high-tech equipment are not the usual pastimes for telecommunications and data processing executives. But the requirements of an international data network are substantially different from that of a domestic link. Where technology and equipment usually take precedence in domestic links, it is politics and regulations that create the biggest headaches when data is going overseas.

An international network requires special expertise in order to deal with the political issues as well as the technical problems, and some companies have found that the most cost-effective route is to use a public packet-switched network — such as Telenet Communications Corp.'s Telenet, Tymnet/McDonnell Douglas Network Systems Co.'s Tymnet or Computer Sciences Corp.'s Infonet — all of which offer X.25 networks with nodes in European and Asian countries.

The international data scene is nothing if not fluid. Several years ago, the U.S. deregulated domestic telecommunications. At that time, many feared that this move would result in an international data war as foreign countries moved to protect their own communications facilities. But that prediction has not come to pass. Instead, in many cases, Europe has followed the U.S.'s lead and has begun a slow deregulation of its PTTs. This trend has been hailed by both network providers and multinational companies, which maintain their own private networks.

Jenkins is a Boston-based free-lance writer.

At the same time, regulations as to which types of data can be passed across the border have gotten more strict. This is the era of protectionism, not only in the U.S. but in many other countries as well.

Piece of the DP pie

In an effort to protect their own often fledgling data processing industries, companies have limited data flow to ensure that the home team gets a piece of the DP pie.

Perhaps the most confusing elements of international data networks are the rules and regulations that build up as data passes from country to country. While the Consultative Committee on International Telephony and Telegraphy and other organizations have made great strides toward standardizing the technical aspects, little has been done to standardize the regulatory scene.

A company with data links to three countries can now settle on a standard protocol and interfaces. But it must conform to three sets of laws. And, as many have found out, some countries are easier to deal with than others.

Reputation gets around

The country with the worst regulation reputation is said to be West Germany and its communications utility, the Bundespost, while the country with the best reputation is reportedly Great Britain.

Not surprisingly, the view U.S. organizations have of these two countries is affected by the level of deregulation they have achieved.

West Germany is terrible for companies attempting to set up an international data network, according to Allen Lopp, manager of corporate telecommunications for Racine, Wis.-based S. C. Johnson & Son, Inc., more commonly known as Johnson Wax.

Lopp recently established a private network using both Tymnet's international service and his own complement of transatlantic leased lines.

West Germany has strict requirements on what equipment can be used on a data network as well as on the software that a company chooses. And the government has established stringent restrictions on what data can be transmitted across it.

The Bundespost, Lopp says, is a "bureaucratic organization." Many of its rules are inflicted on companies "under the guise of security reasons," he adds, but its major interest is to protect its sources of income.

Need time and money

Tony Lash, president of Toronto-based value-added network firm TIL Systems, adds that in West Germany, the cost of leased lines has been increasing and the approval process for any lines and equipment takes a long time.

Great Britain, on the other hand, is lauded by many for having made great advances in the availability of data communications.

Under the Thatcher administration, the British PTT was unbundled, and a new firm, Mercury, was created. The lessening bureaucracy and increased competition has resulted in a much friendlier climate for multinational data communications.

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'Stuff at a decent price'

"England is phenomenal," Lopp says. "It's really been great over there as far as getting this stuff at a decent price." Lopp has two leased lines to Great Britain that his firm uses for voice and data. And with the low telex rates Britain has set up, Lopp has been using his leased lines to transmit the messages overseas and then send them to third countries via Britain's telex facilities.

However, Lash notes that while the price for data communications may be right, the time it takes to get a leased line is too long. Lash says that in Great Britain a company may wait months for its facilities compared with an average of 20 days in Canada.

Even Sweden and West Germany take less time for approval, he adds.

The creation of Mercury as an alternative carrier "supposedly made it easier to get approval," says Kenneth Miller, founder and chief technical officer of Marlboro, Mass.-based Concord Data Systems, Inc., a communications company.

'Doesn't know beans'

Unfortunately, the government relinquished approval responsibility to the British Standards Institute, which, in Miller's words, "doesn't know beans about what is going on."

The comparative performance of both West Germany and Great Britain are related to the steps they have made toward deregulating telecommunications, according to Frank Urbany, associate

administrator and director of the office of international affairs for the National Telecommunications and Information Administration (NTIA).

He adds that the U.S. government is pressing its case for increased deregulation.

Overseas market constrained

West Germany, he says, "continues to be influenced by past practices," but "our Congress is rather concerned about the U.S. being an open market and yet, when we look at the overseas market, it is very constrained."

Protecting local markets is the key to most foreign countries' reluctance to deregulate.

For example, West Germany requires government-approved communications equipment — and Siemens AG is the vendor the Bundespost has chosen.

U.S. vendors vulnerable

The reason the U.S. is pressing for more open markets is because, through deregulation, it has left its own vendors vulnerable.

"The reason the U.S. administration is concerned is that our markets are quite open and accessible to foreign providers," Urbany says, but "overseas administrations tend to be extremely protectionist."

Protectionism creates a stumbling block of another sort when foreign countries attempt to protect the income derived by long-distance data services. Often, the extra money provided by higher priced international data access helps subsidize the local service. By allowing competition, the government would also lose that extra income.

Government loses revenue

"I think that's counterproductive," Urbany says. His point is that action forces organizations to move their communications operations to a less costly locale, and the government loses that revenue entirely.

Deregulation — in addition to lowering costs to the end user and allowing more rational equipment selection — would result in better service and extra income for foreign governments.

Urbany says the trend toward deregulation is just beginning in many parts of the world. But he predicts that during the next few years, the monopoly of national PTTs will change, allowing greater competition in the international market.

Company executives can avoid regulatory headaches by using a packet-switching network because the majority of the network is already in place. The company only has to worry about conforming its own site to the necessary regulations.

The problem of cost

But there is yet another factor contributing to the problems: cost.

Greg Riso, vice-president of MIS for Pharmacia, a pharmaceutical company, chose to go with Infonet to establish the U.S. company's link with its parent firm Pharmacia AB in Uppsala, Sweden.

He says that to establish a private network he would have had to spend too much money. "I don't feel I have the expertise in-house, and to acquire expertise would have been fairly expensive itself," Riso says.

He adds that, although Pharmacia investigated several other intercontinental carriers, Infonet appeared to provide the most service at the lowest cost — currently about $2,000 per month.

The trend toward deregulation is just beginning in many parts of the world. During the next few years, the monopoly of national Postal Telephone and Telegraph authorities will change, allowing greater competition in the international market.

FRANK URBANY
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

Pharmacia's applications consist mostly of the transfer of electronic mail among the company's various sites. But the primary justification for the pharmaceutical company's international network was to transfer research and development information between locations. Riso says this is a batch process, as test data for experimental drugs is passed between companies.

But Purolator Courier Corp. in Basking Ridge, N.J., had a different reason for choosing an outside vendor — reliability.

Barry Van Zile, Purolator's director of telecommunications, says that his company's network is used primarily for the exchange of data for tracking down lost packages.

Because Purolator's business is extremely time-dependent, the company cannot afford any downtime in its international network.

Purolator's backup

"We always need redundancy," Van Zile says, so Purolator uses Infonet's facilities as a backup control site, should the primary site in Hackensack, N.J., go down. The Infonet network itself contains built-in redundancy as well, assuring the express parcel carrier constant access.

But both Van Zile and Pharmacia's

WHY CHASE MANHATTAN OPENED ITS ACCOUNT WITH 3Com.

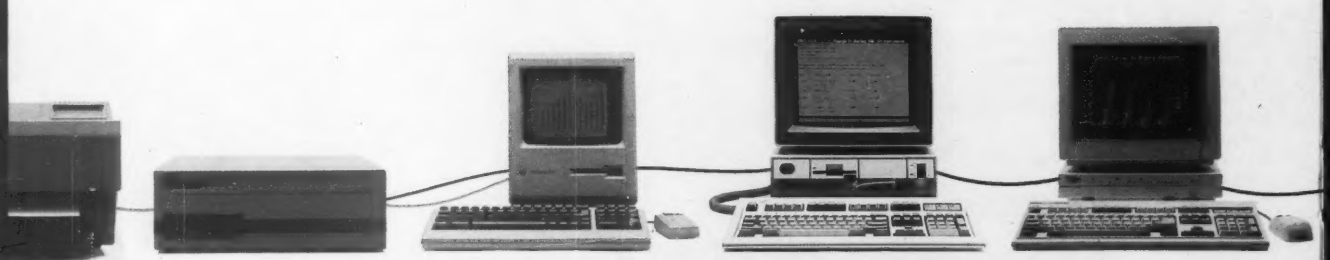
When one of the world's biggest banks decided to network its Corporate Services Group, the long term implications of such a decision meant that every option had to be thoroughly investigated.

Whatever the final decision, it had to be an investment that both the group and the bank could live with for a long, long time.

Rejecting mainframe/mini/terminal configurations for cost reasons, they decided a PC-based workgroup system was the answer.

Chase's Corporate Services management chose 3Com's 3System, supplied and supported by a 3Com Authorized Dealer.

The 3System for Chase's Corporate Services links five buildings in the Wall Street area and will eventually expand to facilities in upstate New York. Multiple 3Servers run 3+ operating software and 3System's superior electronic mail to multiple users.



3System also allows network users entry to the bank's IBM mainframes via Bridge Communications gateways. Data can be downloaded to the 3Servers and then accessed by any member of the workgroup.

And because of 3System's security, managers and other administrative staff can share data and handle the most confidential of business transactions.

Like other 3System users, Chase Corporate Services Group found it could run an almost limitless choice of application software on its network.

They chose "Smart," an integrated package combining database, word processing and spreadsheet, the "Higgins" workgroup personal productivity program and DNET Menuing software.

Since it has been installed, 3System has had no downtime. And because all data is backed up nightly, there hasn't been a single instance of lost data either.

Other major Wall Street financial companies like Chemical Bank of New York, Shearson Lehman/American Express and Merrill Lynch share Chase Corporate Services Group's enthusiasm.

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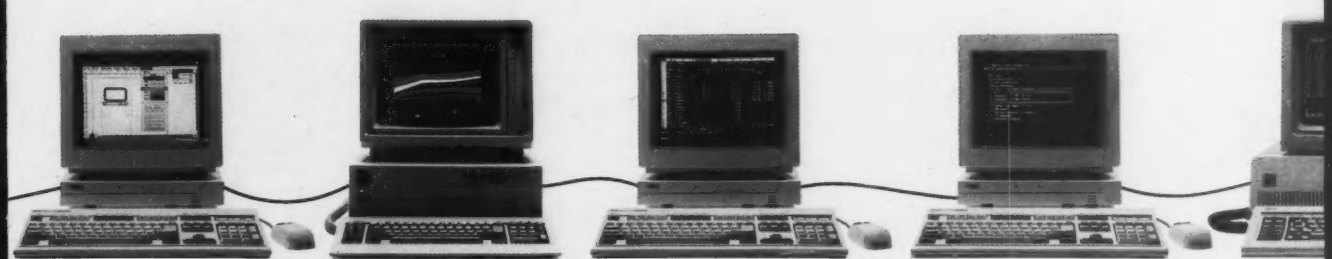

Riso say that they would build their own international network should the economics of the situation change.

That phenomenon would occur primarily as a result of increased international data traffic. Riso, who is in the beginning stages of establishing his international network, says that he expects his overseas business to grow as the DP capabilities of the parent company in Sweden catch up with its North American counterpart.

But Van Zile says he is not sure how much traffic on his network will increase. "We keep looking at the bills and the traffic on a monthly basis," Van Zile says. But because the network is used primarily to find lost or misdelivered packages, network usage will remain low as long as the company keeps doing a good job.

Standards have long been a struggle in the international scene. But the widespread use of X.25 on both public and private networks has eased users' concerns about the technical end of linking dissimilar hardware in other countries.

Riso says that Pharmacia also had a more technical reason for choosing a packet-switching network. Because the company has recently shifted over from Honeywell, Inc. systems to IBM mainframes and is also equipped with Digital Equipment Corp. minicomputers, the X.25 protocol was necessary, Riso says, to allow all of these different machines to communicate.

Standards have long been a struggle in the international scene. But the widespread use of X.25 on both public and private networks has eased users' concerns about the technical end of linking dissimilar hardware in other countries.

Another de facto standard that has now crossed international lines is the IBM Personal Computer. The widespread use of IBM and IBM-compatible personal computers permits standardization of software as well as hardware and offers the opportunity to take advantage of other communications protocols such as X.PC, users say.

X.400 still being defined

Another standard that has yet to be widely implemented is X.400, a standard format for electronic mail transfer. Parts of X.400 are still being defined. But Joe Mazzeo, vice-president of Infonet marketing, says that its completion and acceptance is very important to his business.

He says that 75% of Infonet's international business consists of E-mail. And although most users will not have to be aware of X.400, it will enhance his company's capability to transfer E-mail among the many different computers that are connected to the network.

In the long term, it is the Integrated Services Digital Network (ISDN) that everybody expects will become the standard backbone network. This combined voice/data standard, which provides digital pipelines with a variety of bandwidths, is expected to become commercially popular in about 10 years.

Due to its widespread use beyond the usual planning horizon and because the system is being designed so that existing X.25 networks will be able to interface with ISDN, few users fear that the growth of the ISDN standard of the future will make the capital investments of today outmoded.

While the technical standards for international data networking continue to evolve, political and regulatory issues will take the front seat in corporate planning.

Deregulation is allowing greater freedom in many countries. But to many countries still, the free flow of data outside of its boundaries represents a risk they are unwilling to take.

Many countries maintain strict rules about what data can and cannot be sent outside of the country. For example, in many countries, shipping personal or financial information is strictly forbidden.

Users and network vendors both say that countries in South America, Asia and Africa lag behind Europe and North America in unrestricted data flow.

Reagan's guidelines

But even the U.S. is not free from security concerns. The Reagan administration recently established guidelines limiting the transmission of data it considers classified — such as Strategic Defense Initiative, or Star Wars, research information — outside of the country.

At first, many U.S. companies protested these guidelines, fearing that they were the first step toward the loss of control over data that they consider theirs as much as the government's. But the NTIA's Urbany says this concern has largely blown over.

One reason that nobody has strongly fought such limitations, either here or in other countries, is that they are virtually impossible to enforce.

And while nobody will admit that his company breaks the law by transmitting data prohibited by another country, several users suggest that it is done on a fairly regular basis. "A lot of places do that," one person said, "but who wants to be the first to be caught?" ❖

Pulling together a LAN strategy

BY REBECCA HURST

A famous Chinese proverb claims, "A journey of 1,000 miles begins with a single step." That advice holds equally true for telecommunications or DP managers planning a network strategy.

"People who try to look at the whole project can get paralyzed by the size of it," explains William Harrison, director of new business development at Communications Management Systems, a McLean, Va.-based division of Cincinnati Bell Information Systems, Inc. Managers need to keep in mind the right moves to make in planning a network. "You need to take the steps that will preserve your options for unforeseeable change," Harrison asserts.

As a DP or telecommunications professional, you need to look at products and product standards, but these are only two components of a successful network strategy. You also need to consider your organization's corporate strategy, the users' needs and networking's financial demands. Taken together, these factors represent a structure around which you can build a network. However, this structure will not hold without an understanding of how to translate your networking ideas into a project that will produce tangible results.

Managers can provide many examples of how to make a networking project fail. "I've seen several project efforts costing more than $30 million that have nothing to show except multiple volumes of documentation," says Judy Schneider, director of government services at Advanced Technology Systems, a Vienna, Va., technical consulting firm. At the heart of many of these failures is a project management approach known as The Big Plan.

The Big Plan typically starts with a manager or committee that states that in five or 10 years, the company will have developed a large networking system, Schneider explains. One problem is that without a list of specific goals, the five- or 10-year project will produce nothing. If the network is actually completed, it may face almost immediate obsolescence. "If you plan a network based on today's requirements, then you have to assume that all technology stops, that company growth stops and that there will be no corporate reorganizations," Schneider notes.

Instead of following the Big Plan, managers need to break large projects down into segments. "Projects and people both need deadlines," Schneider asserts. As a manager, you should study a proposed project for six to eight months to decide exactly what goals you want to achieve, she suggests. "Then, look at the processes necessary to support it."

For example, a manager might decide that 24 users each need to have a personal computer connected to a local-area network (LAN). Instead of installing the whole system at once, the manager would develop a plan to add personal computers and application packages in increments, Schneider says. A first installation might include four PCs and two software packages. "A manager should not try to bring 24 PCs and 12 applications up at once, because there are too many variables," she warns. "That leaves too much room for error."

In addition to controlling quality, incremental project deadlines give managers a yardstick by which to measure progress and leave users with a sense of accomplishment, Schneider notes.

"If you go a month or two without being able to show something, people wonder what you're doing. People should seriously question what is happening with a network project anytime they do not see progress for that amount of time," she says.

Similarly, the individuals working on the project may question the importance of their work if they go to their terminals day after day without turning out a product, Schneider says. Therefore, managers should never let six weeks go by without something deliverable, she recommends. "From my experience, I have found that the six-week deadline is very real to people."

KAREN STOLPER

These deadlines can be tied to product installations or other aspects of the networking project, Schneider notes. For example, she says, "it can be a draft study document, data elements, coding or test plans." If certain components of the project — such as documentation — take several months to complete, managers should further break these into subcomponents that can be completed within four to six weeks, she suggests.

Armed with with a long-term project management strategy, DP and telecommunications professionals need to begin their networking projects by examining their company's current and future needs. These needs are determined by looking both at the corporate strategy and users' needs, Harrison says. "Which of the two steps comes first is arbitrary," he says. "You don't know the corporate strategic plan until you know what the users' needs are, and

Hurst is a *Computerworld Focus* senior writer.

sometimes the future needs of users are governed by the strategic plan," he says.

To understand a corporation's strategic plan, technical managers should talk with upper management about planned acquisitions and divestitures and whether the company will maintain a centralized or decentralized system, Harrison says.

Plans may change

Next, he suggests, "telecommunications managers need to realize that those corporate plans may change drastically during the following five years." In addition, corporate leaders may rely on DP or telecom professionals to keep them abreast of evolving technology and its significance, Harrison notes. This, in turn, may affect corporate policy.

To understand users' needs, Harrison says managers need to ask users future-oriented questions such as, "What do you need to keep up with industry? What do you want to do that you can't do now?" Managers then need to go back to corporate management to find out who the future users will be. For example, upper level managers may state that a certain department is going to automate and will need access to the corporate mainframe. "Only by looking at both sides can you get a total view, because different people are aware of different technology needs," Harrison says.

Once you understand the users' communications or connectivity requirements, you must choose the technology that best fits those needs. This requires a solid knowledge of networking's strengths and limitations. Some people correctly identify a problem but then try to solve it using the wrong products.

"I have seen people add a network, thinking users could share resources using fewer processors," comments Ken O'Mohundro, president of Able Computer, a Costa Mesa, Calif., networking firm. Instead, the networking software causes the need for an extra processor, he says.

Less is more

Sometimes less technology is more. Short messages and electronic mail are perfect applications for a network, Advanced Technology's Schneider comments. These transmissions can save users time, and because they are short, they do not drag down the network response time. By contrast, "sending a large document across a network can be like trying to push an elephant through a straw," Schneider notes. The sheer volume of data overloads the network. If this data is traveling from one department to another in the same building, it may be more efficient for users simply to swap floppy disks, Schneider suggests.

Another important aspect of matching users' needs to the technology is listing needs by priority to determine the networking answer that most effectively fulfills those needs. "The solution you want is a network that is a specialist at handling your most critical needs and enough of a generalist to take care of your other ones," he says.

For example, a company may have several Digital Equipment Corp. VAXs installed in many different locations. "These computers may have no reason to talk to each other, but the users may need to talk to data bases located on different machines," O'Mohundro says. Such users do not need a network, he notes, they need a terminal that can access a number of VAXs.

Along the same network, workstation users may need high-speed file transfer between the VAXs and their desktop systems. "These users would require a network such as Ethernet that can support high-speed transfer," O'Mohundro notes.

Another group of users might need a great deal of access to a single data base. These users would require a high-speed bus, such as DEC's CI Bus, in order to group the VAXs into a cluster that supports high-speed data base transactions. "The CI is about seven times faster than Ethernet," O'Mohundro claims.

Determine the best solution

If the VAXs must address more than one of these scenarios, managers should categorize the situations in terms of frequency and importance to determine the best technology solution, O'Mohundro says. For instance, an Ethernet-type network will support the workstation users' file transfers adequately, but it will bog down under the heavy central data base transactions, he notes. However, if the data base transactions are usually sent together in batch mode at night, workstation users will not be affected by the slowdown during office hours.

In addressing users' communications needs, data processing and telecom managers also have to analyze the impact technology may have on the users. One example is the effect of electronic mail. "Unless handled properly, E-mail can be dangerous because it gives employees an opportunity not to talk to each other," O'Mohundro warns. "E-mail is one way to turn an introvert into a hermit," he says. A manager who establishes electronic mail should be careful to provide some replacement mechanism for social interaction, he adds.

After determining the networking or communications technology that best suits the users' needs, managers must confront the financial aspects of these solutions. Financial factors include not only the cost of equipment but also its impact on user cost-efficiency and corporate funds. "You have to factor everything into the total networking cost," according

to Ronald Brown, manager of office automation and telecommunications management for Coopers & Lybrand in Boston.

For example, a business may be looking at the difference between twisted-pair wiring and fiber-optic cable, Brown explains. "Does the current twisted-pair wire meet the company's needs? If not, what is the cost to take it out and replace it with fiber?" he asks. If the company delays putting in fiber, the lower employee productivity may cost the firm more than implementing the new cabling scheme.

Comprehensive look

In terms of actual technology costs, managers need to look at the total network, Able Computing's O'Mohundro advises. "Know all the hardware and software you will need to have the network perform all the functions you require." Too many DP professionals only look at parts of the network, he notes. These managers quickly find their expenditures far exceeding their estimates. For instance, a user who requires Ethernet from DEC may not realize that DEC's price only includes the hardware. The user has to go to a network protocol vendor, such as The Wollongong Group, Inc. in Palo Alto, Calif., for the software.

A related problem lies in making price comparisons based on pieces of different technologies. An illustration of this mistake is when a user compares switches with local-area networks, O'Mohundro explains. "If a switch costs $100 per port and a LAN costs $400 to $1,000, does that mean the switch is more cost-effective?" No, he says. "You have not looked at the whole story." To function as a network, the switch also requires multiplexers and wiring, O'Mohundro says. By the time these items are factored into the cost, the switching solution may cost as much or more than a LAN.

Another factor to consider in financing is a company's ability to fund a networking project. Organizations have to decide whether they want to undertake heavy expenditures in the short term or moderate expenditures during a longer term, Harrison observes. Such factors can effectively give a financial manager, rather than the DP or telecom professional, the power to choose a communications solution, he says.

Many telecommunications managers may be angry about the financial constraints that manipulate their decision making, but they need to understand the reasoning behind these constraints, Harrison says. "The manager has to be aware of the corporation's need for financial planning and should help financial managers by giving them information on the communications options available." This financial responsibility is just as important as the technical manager's responsibility for taking into account the users' needs as well as the corporate strategy, he adds.

Corporate standards

A final concern in planning a network is determining who will decide corporate communications standards. Dividing the responsibility between the corporate center and departments offers the most flexibility, consultants agree. "If you have some central standards, you have the option of operating in centralized or decentralized control," Harrison says. "Without central standards, your control is always decentralized."

Centralized control provides several benefits, but few companies have the luxury of developing a companywide communications plan, says Eugene Buechele, vice-president of engineering for Communications Solutions, Inc., a networking firm based in San Jose, Calif. Centralized control allows managers to standardize on certain technologies and to provide uniform applications development and wiring, he notes. As a result, the network is easier to support. "The negative side of centralized network control is that it takes longer to implement strategies corporatewide, and the network will not exactly match the needs of local groups," Buechele adds.

Decentralized control allows departments to choose the technology that best meets their needs and to capitalize on technology investments they have already made. As a result, networks match departmental needs and interests, Buechele notes. The drawback is that it costs the company more to support the network. There also is a limited scope for applications development because there are fewer users.

The best of both worlds

A company that uses both centralized and decentralized control combines the best of the two approaches. With this strategy, departments adhere to a central core of standards, but the solutions they choose based on those standards may vary. The combined-control approach is cost-effective, addresses a broad spectrum of needs and preserves the company's applications investment.

In addition, departments can develop networking solutions at their own speed, rather than having to wait for others because of what Buechele calls "corporate communism."

Finally, while developing a network plan, keep focused on why you are implementing it, Schneider advises. "List your reasons in order of importance and let them guide the development of your network strategy." Some people go off on a tangent, she warns. "They end up in never-never land."

And that is a journey most managers do not want to make.

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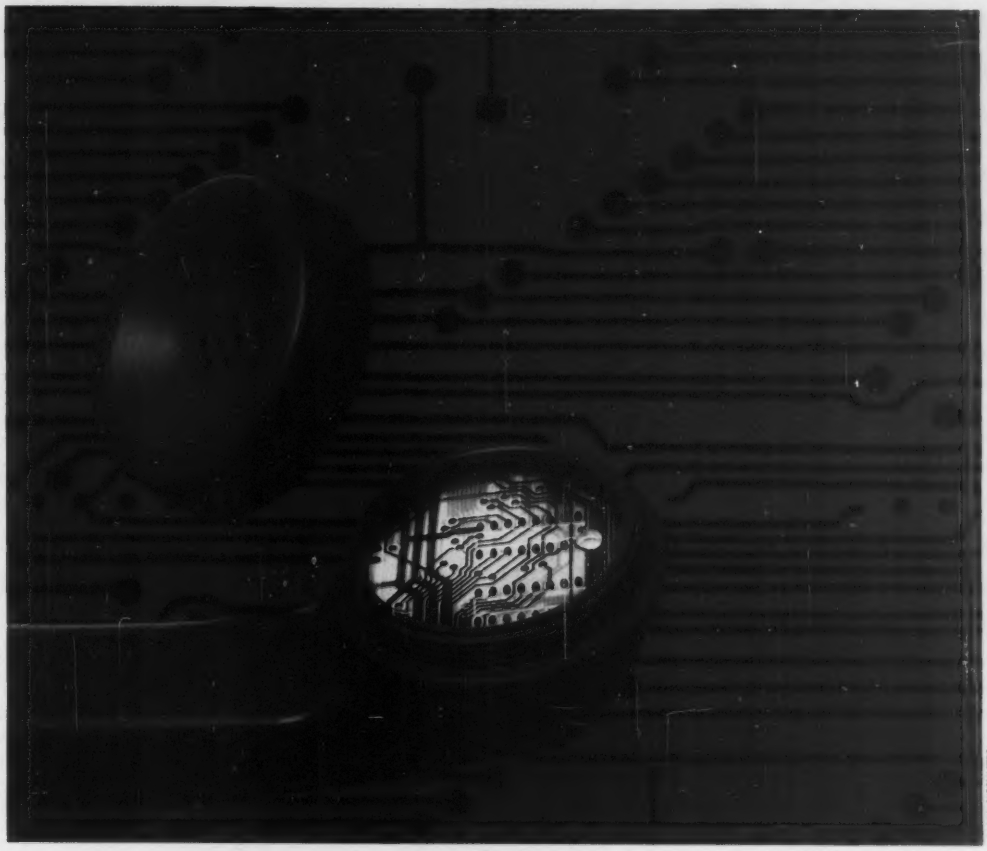


GEOFF O'CONNELL

Superphones

BY MICHAEL TUCKER
FEATURES EDITOR

Three years ago, everybody just knew that telephones and personal computers would merge. The evidence seemed overwhelming. Workstation vendors were coming out with computers that had telephone handsets built right into the keyboard. IBM was gearing up to purchase Rolm Corp., which had invented the idea of data phones in the first place. AT&T, newly divested of its local telephone service, was setting up AT&T Information Systems as its entry to the computer world. "Integrated voice/data" was the slogan of the age.

Even the industrial psychologists were getting into the act. Sobersided consultants were informing all who would listen that senior-level executives did not relate to keyboards. But telephones — those were another matter. The key to strategic systems, they said, was to make a personal computer look like a Touch-Tone phone.

Now, three years later, the industry is sadder and wiser, and none of the speculation seems to be true. AT&T's entry into the personal computer market looks like a full-tilt charge to disaster. The IBM/Rolm union has so far avoided divorce, but the couple has sought marriage counseling in the form of management shake-ups at both companies. You don't hear that much about integrating voice and data these days, and even the most technophobic executive seems to have learned to coexist with keyboards.

As for the computer with the built-in telephone, that idea is not so popular these days either, according to Will Zachmann, a vice-president of research at Framingham, Mass.-based International Data Corp. (IDC). He expresses it simply and bluntly: "The voice/data workstation was a ridiculous concept, nothing but a mass of inflated hype [that] no one needed."

So, does that mean the great merger of telephones and computers is off? Can MIS, with a sigh of relief, turn its back on private branch exchanges (PBX) and deal instead with traditional data networking solutions such as local-area networking (LAN) and terminal emulation?

Yes and no.

Telephony has turned into a science and an art. Telephones themselves have acquired a bewildering variety of forms, powers and abilities. They range now from simple hand-held systems to full-fledged videophones. As a result of those new forms and powers, the current generation of phone technology can provide valuable tools for MIS.

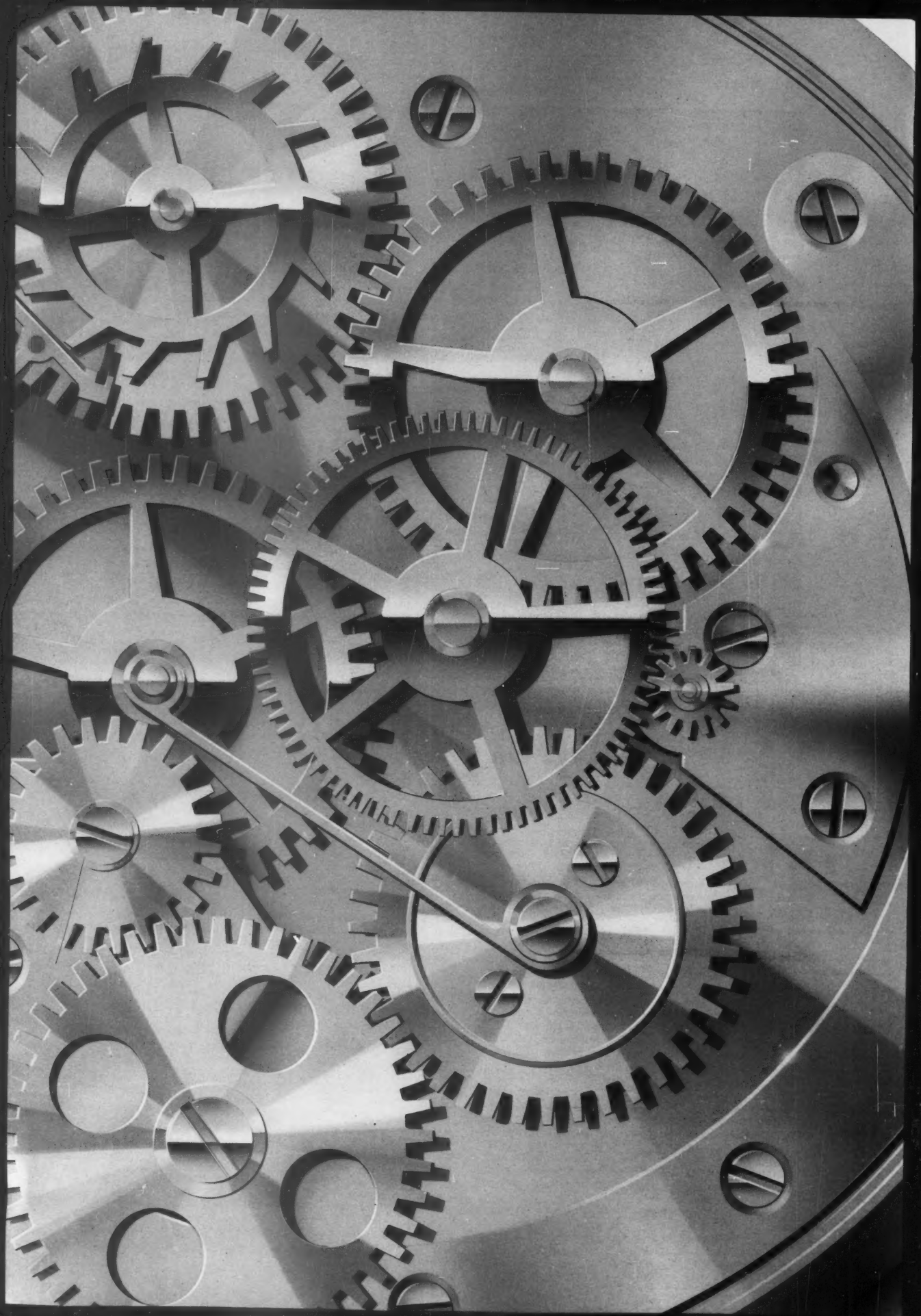
Very large PBXs — the kind that take and make millions of calls on a daily basis — usually have at least some data transmission capability. These devices are so powerful that there is an interesting philosophical question whether such devices are even still in the realm of what normally constitutes "telephony." Depending on the situation and the installation, MIS may indeed find such powerful "data PBXs" the best or even only choice for data transmission available.

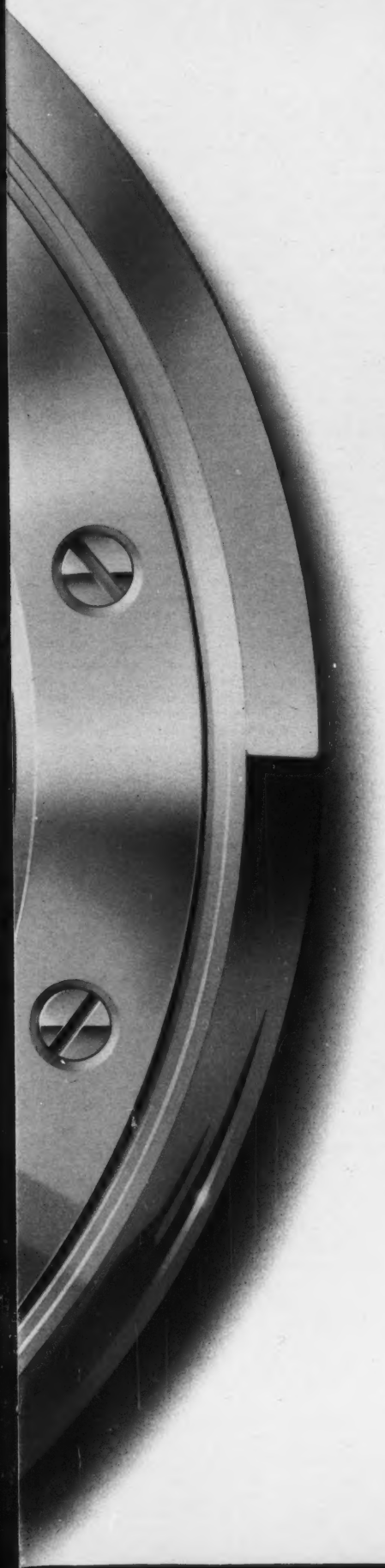
However, what about smaller PBXs, devices that are clearly in the realm of traditional voice communications? Might those, too, have some role in data transmission?

Those smaller switches may actually give some aid and comfort to MIS. Not only can these units provide increasingly sophisticated voice communications to individual MIS departments, but they also can yield important data transmission capabilities in situations in which a LAN or a cable would not be cost-effective.

This ability is possible because small PBXs have recently started to take on some of the functions of large ones. In an effort to woo small businesses and the individual departments of Fortune 1,000 companies, vendors have introduced increasingly intelligent small departmental PBXs. In fact, the competition at the low end of the spectrum has become intense lately, with such big-name players as AT&T, IBM

Foreign vendors vie for a piece of the U.S. telecommunications market, page 39.





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we never stop asking "What if..."

HEWLETT PACKARD
Business Computing Systems

and Northern Telecom, Inc. getting into the act.

Little PBXs can be useful to MIS officers for a number of reasons. The most obvious of these is the advantage of having real control over voice communications within their own departments.

For example, one of the many vendors of intelligent departmental PBXs is Isoetec Communications, Inc. in Darien, Conn. Isoetec is unusual in that it specializes in departmental voice products. The company's offerings range from the System 96/66, which supports from 13 to 36

Isoetec's *System/228*

telephones, to the recently introduced system/228, a digital system that can support at least 216 phones on 12 different lines.

The Isoetec systems provide the usual benefits for voice communications plus a few interesting extras. A representative user on the voice side of the equation is the Delaware Administration for Rapid Transit (DART), which is located in Wilmington, Del. DART represents public transportation for virtually the entire state of Delaware.

Early on, the organization found that to get people to ride its buses, it needed some way for customers to phone someone and ask questions about scheduling and routes. "We discovered that you need a 'humanistic' device," explains Stephen R. Welch, a DART officer. "People can be standing there with the literature in their hands — the route maps, the schedules — and they'll still be uncomfortable. They need someone to give them a personal reassurance that they have the right schedule or that they've interpreted it correctly. Which means, from our perspective, the telephone is vital to the success of DART."

But like most public transportation agencies, DART simply does not have the resources to dedicate a large staff to answering incoming calls. There are only three operators to handle some 800 information calls a day as well as regular business calls.

In 1986, DART decided to purchase the Isoetec System/228, an intelligent PBX, to help it handle the load. "Prior to our going with the system, we were losing 10% to 15% of incoming calls every day. People were getting a busy signal or being put on hold so long they just hung up," Welch says. "Now we're down to 5%."

The biggest test of the system came during a recent snowstorm. In a single morning, incoming calls swelled to 2,800. "The PBX was sufficently flexible that we could log seven other people into the system," Welch notes. "They could answer questions at their desks and go back to their usual work in between calls. We lost only 10 calls that whole day," he claims.

That's all well and good for voice communications. But does that situation have anything to do with the concerns of hardcore MIS people whose communications requirements have much more to do with data?

Yes. As hordes of hackers with modems have already demonstrated, the business of sending data via phone lines is neither technologically demanding nor even interesting. In the case of a digital system, like Isoetec's, it gets downright dull. According to IDC's Zachmann, "That you do data transfer over a phone line is pretty superficial."

But sometimes the route to success lies directly through superficiality.

Voice technology, however unexciting, can provide data transmission capacity at times and places when more sophisticated techniques are simply not available. The System/228, for instance, is clearly geared to voice rather than data. However, it can also provide data transmission in a pinch. For example, the California state Senate in Sacramento, another Isoetec user, orginally purchased its system to handle nothing but voice. But the Senate has gradually expanded the system's duties to include some data.

Andrew Flett, data processing consultant to the state Senate, explains: "Basically, we've got a couple of dozen users on a LAN. Each time we added a user, we'd have to tear up another carpet and run another cable into the computer room." And the Senate was running out of cable space.

"Then, along came the Isoetec people," Flett says. "They suggested we stop tearing up rugs and just use their System/228." The state Senate did install one in early 1986. Currently, the phone lines are supporting four network users. "As I understand it," Flett says, "the system was designed to be used lightly by terminals. We're not doing that at the moment. We've got people who are on it pretty much all day long."

There have been some problems, however, perhaps because the system is being used continuously. "We're not quite sure what's causing the effect, but occasionally users are getting dumped off the system. It could be in the software, it could be a faulty plug. Still, it's not a big problem, and, generally, we're happy," Flett says.

So, is the merger of data and voice on again? "Well, I haven't spent a whole of my time getting excited about [that question]," Flett says. "I see [our Isoetec system] as an interm solution. With the next upgrade, we'll probably switch to fiber optics."

However, in the meantime, he claims that "it takes one headache out of my life."

Phone fanfare

OK, maybe, if pressed, we can admit PBXs have their place in MIS. They can provide extra data transmission capacity at times and places when other, more traditional methods are "a headache." But how about phones themselves? Is there any reason that MIS people should concern themselves with those devices?

Probably not. Quite simply, the management of telephones is somebody else's job. After all, the purchase and control of office equipment has little to do with the corporate mainframe.

Yet MIS managers may still wish to be aware of what's out there in terms of telephone technology for two reasons: first, because they are phone users themselves; and second, because they may, on occasion, be asked to advise their employers on the purchase of telephone equipment.

Telephone selection can be hard because the devices are becoming increasingly sophisticated. They are beginning to sprout screens, keyboards and even

Just the fax, ma'am

USING THE PHONE LINES to transmit something other than voice is actually an elderly technology. Facsimile machines, after all, have been sending and receiving graphics for years.

The fax industry is undergoing a period of rapid transition. Companies are displaying color fax devices, faxes that link with computers and, now, desktop faxes.

For instance, Xerox Corp. in Stamford, Conn., recently unveiled a line of desktop faxes known as the Series 70. These are small, user-friendly machines that print on standard rather than thermal transfer paper.

One user of the Series 70 is Perkins Coie, a Seattle-based law firm. The firm purchased six machines to help link their central office with outlying local offices. Perkins Coie has more than 230 lawyers spread over five different locations. The firm is a high-volume fax user, with an average of 10,000 pages transmitted a month. The central office contains full-size fax equipment and a full-time staff of communications specialists. But the smaller offices require fax machines small enough to fit into a limited space and simple enough for novice users.

At least for the time being, the Series 70 fits Perkins Coie's bill. "Eventually, everything will be laser printers," notes Marsha Lash, who serves as communications lead for the firm. "But as we work on getting there, [the Series 70] is a good interim solution." — MICHAEL TUCKER

microprocessors. Consider, for example, the EZ-Talk system from Harris/Lanier Business Products in Atlanta. This telephone looks like a small personal computer. It offers a keyboard, an LCD screen and on-board random-access memory (RAM). The RAM lets a user keep an online telephone directory of 100 names and numbers, an amount that can be upped to 300 with a memory expansion card.

You can also keep an appointment and meeting calendar on the phone. The vendor notes that you or an assistant can enter up to seven events per day for 60 days. There is also an attached alarm that reportedly notifies you if you somehow manage to forget to look at the calendar.

In short, EZ-Talk performs many of the same functions as a PC running a desktop organizer program. The resemblance to a microcomputer gets still closer in light of the fact that EZ-Talk has an electronic mail function. With it, you can send electronic memos to the screens of other EZ-Talk users. You can even talk to one person while exchanging text with another.

In fact, it is possible to argue that for some people a smart phone is a better tool than a PC or terminal. Some end users, after all, need E-mail and voice communications far more than local processing power or access to corporate data. For those users, telephones can be inexpensive alternatives to PCs.

Even if users do need access to a mainframe, telephones can still play a role. In fact, there is a whole class of terminal/phone hybrids — supported by sophisticated digital communications networks — that may be the best telephone instruments possible for MIS managers.

For example, Northern Telecom has marketed for some years the Meridian DV-1 system, which the company calls a "distributed data processing and communications system for work groups, branch officers and departments of large multilocation organizations." The DV-1 is effectively a Motorola, Inc. 68010-based microprocessor, running under Northern Telecom's version of Unix, that acts as both a communications controller and a small business computer. It is a hybrid because it manages telephones, terminals and PCs and runs Unix-based software at the same time.

The DV-1 system shows up on the desktop by interacting with any number of terminals and workstations. These range from simple telephones to a group of graphically oriented terminals to machines, such as the Meridian M6110, which are IBM Personal Computer compatible. All of these units can be terminals displaying up to six windows at the same time — displaying applications running on the DV-1, on a mainframe host accessed via a gateway and on the local workstation. Thus, an MIS officer could debug a Cobol program on a mainframe, examine a Unix-based graphics package on the DV-1, cast an eye on a co-worker's spreadsheet, read his E-mail and take a phone call from payroll, all on the same screen at the same time.

Northern Telecom isn't alone, however. AT&T maintains a large line of digital voice terminals. The smaller of these looks much like Lanier data phones. The AT&T 7406D, for instance, boasts an RS-232C port, 18 programmable features and, in an advanced version, an LCD screen that can display two lines of 24 characters each.

But AT&T also has a number of phone/terminals. The Personal Terminal 510 provides a touch screen, a telephone handset and a keyboard in one discrete package. It can be purchased as either an analog or a digital system. (AT&T has shown voice/data terminals that actually have two lines coming into them — one for data and one for voice.) The 510 also has its own unique application software, which actually comes in firmware cartridges. There are, for instance, a training cartridge to give users a tour of the system and a security cartridge to keep unauthorized personnel from getting the same.

You can link the 510 to just about anything via AT&T's communications processor, the System 85. This device is based on the Integrated Services Digital Network protocol — a single digital communications protocol that will reportedly support everything from phones to video to data.

A single System 85 can support up to 32,000 user stations. In the process, it can provide not only voice and data communications but also a gate to IBM Systems Network Architecture-based equipment.

Harris/Lanier's *EZ-Talk system*

Suppose, though, that still isn't enough. If that's the case, you might want to consider a full-fledged videophone.

During the 1960s, there was a lot of interest in video telephones. Working models were produced and displayed. However, they proved impractical because standard phone lines simply lack the bandwidth for full-motion video. Eventually, that situation will change as more and more systems adopt fiber optics, but the process will be a long one.

In the meantime, though, several firms are selling telephones that will transmit still pictures either as individual graphics or as part of a succession of photos that give a limited illusion of motion.

The former type of phone is probably the most well developed at the moment. Several products are already on the market. For example, Image Data Corp. in San Antonio sells the Photophone, which allows users to transmit both pictures and voice over standard telephone lines.

The Photophone is aimed at customers who have some need to transmit still photos from one place to another. A hardware engineer, for instance, might use the

Foreign firms look to U.S. telecom mart

LOOKING FOR an international telecommunications carrier? Beyond domestic suppliers, several foreign vendors have recently begun to seek business in the U.S. These carriers include the following:

- **British Telecom International.** London-based British Telecom, the leading telecom vendor in the UK, not only offers access to European markets but also to a number of worldwide digital and analog services. For instance, its international packet-switching network can access 43 countries and 60 networks. Recently, Herndon, Va.-based Mitel Datacom, Inc. announced it would be remarketing British Telecom modems in North America.
- **Kokusai Denshin Denwa Co.** This Japanese telecommunications giant, headquartered in Tokyo, has only in the last few months begun a serious attempt to win American customers. Yet depending on the behavior of the Yen, the company could offer quite a bit to U.S. telecommunications officers in search of a link to Asian locations. In addition to international telephone, telegraph, telex, television and maritime satellite communications services, Kokusai also maintains a powerful research and development program.
- **Overseas Telecommunications Commission.** Japan is not the only path into Asia. This commission, based in Sidney, Australia, can provide telex, facsimile, video and more on an international level. The organization seems to be selling itself as a liaison between North American and Asian business, providing physical proximity to the Pacific markets but doing so while based in an English-speaking nation. — MICHAEL TUCKER

product to send the image of a malfunctioning board to a professional repair man. The images can then be stored on conventional floppy disks.

Similar in size to PC

The Photophone consists of a camera mounted on an extendible arm, a 9-in. display screen and an electronics enclosure. The total system has a footprint slightly smaller than that of a PC. It costs $8,500.

The latter type of phone — a videophone that transmits a stream of pictures — is the younger technology, and it is still suffering from growing pains. These systems offer a compromise between voice-only systems and videoconferencing via coaxial cable or satellite links. With the videophones, users can see one another over standard phone lines but not in real time. Instead, their screens show images that change every few seconds.

This presentation can disconcert the viewer. People on the other end of the line move in quick jerks and mysterious dissolves. Body language is essentially lost. In situations in which clear personal communication is vital, then systems are no substitute for full-motion video and still less for personal contact. But limited motion is sometimes better than none at all.

One of several firms marketing a videophone of this sort is Videocom International Corp. in Tokyo. Videocom is a specialized consulting and systems integration company that is partly owned by the Tokyo-based Japanese telecommunications corporation Kokusai Denshin Denwa Co. Among other things, Videocom sells the Invite 64, a desktop visual telephone invented and manufactured by Kokusai. Invite 64 will not only transmit voice in real time but will also send full-color video at 10 frames per second.

The clarity and color of Invite 64's picture has been judged to be among the best available on such systems. These features were made possible by sophisticated software. Kokusai produced a "predictive coding system" that compresses visual data by identifying variations in the movement of the subject and then transmiting those variations.

Invite 64 is expected to come to the U.S. market this year. Its price will depend greatly on the fate of the Yen.

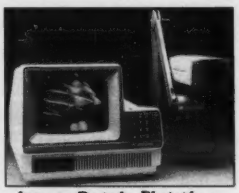


Image Data's *Photophone*

So, with video, voice and data transmission, the common telephone is a rather sophisticated instrument these days. That could, in the long run, be rather important to MIS, despite the fact that telephony has been the responsibility of voice communications managers.

Even in this age of specialization, MIS people are held accountable for an ever-increasing number of duties. Initially, for instance, MIS meant mainframes alone; personal computers and even data communications were outside the profession. Now, however, the microcomputer and the data network are as much a part of MIS as Cobol.

And there are signs that voice communications also are beginning to migrate into MIS. A recent survey jointly conducted by Pasadena, Calif.-based Office Technology Research Group, which is an association of senior-level executives in North America and Europe, and the Data Processing Management Association, a worldwide organization of DP executives, revealed some distressing facts. The survey showed that most MIS people are being called on by their employers to streamline office operations, using whatever technology is available.

In short, it may be that not only will MIS find itself involved with end-user computing but with end-user voice communications as well. ❖

Directing communications at Warner

BY REBECCA HURST

What do Madonna, Bugs Bunny and Jack Nicholson have in common with Donald Winski? The three entertainers are associated with products from Warner Communications, Inc. To determine these products' success and modify marketing strategies, New York-based Warner and its subsidiaries rely on networks of computers communicating with each other.

That is where Winski comes in. As Warner's executive director of corporate information services, Winski is ultimately responsible for ensuring that the multinational organization's processing systems work and communicate as effectively as possible. The task is not a small one. Warner, which earned $2.23 billion in 1986, has 18 companies that operate worldwide.

Nor does it take long to see the implications of this responsibility. Minutes after entering his office, Winski takes a call from London and relays the contents of a telegram he received earlier from Japan. "This [activity] gives you a flavor of what I do," he says.

Warner's several international offices as well as its decentralized business units throughout the U.S. have created the need for different types of computers and networks. "Warner's policy is to put extremely capable executives in place to run our businesses," Winski says. These executives determine how technology is used in the business units.

When these business units need to cross-communicate, it is the corporation's role to set up an effective environment. "When appropriate, we act as the glue between the businesses," Winski comments. However, Warner is not imposing centralized projects on the units. Instead, the corporation works with the business units on a peer-to-peer basis, he explains.

Because telecommunications is considered an integral part of Warner's information systems, Winski has developed a communications strategy based on both short-term and longer range goals.

To represent this strategy, Winski invokes the image of two islands. One island is telecommunications services; the other is business management. Spanning the islands are the short-term measures, or pontoons, that serve to bridge the gaps until long-term connectivity plans, or bridges, can be implemented, he says. Any savings from these stopgap measures can then be applied to future projects.

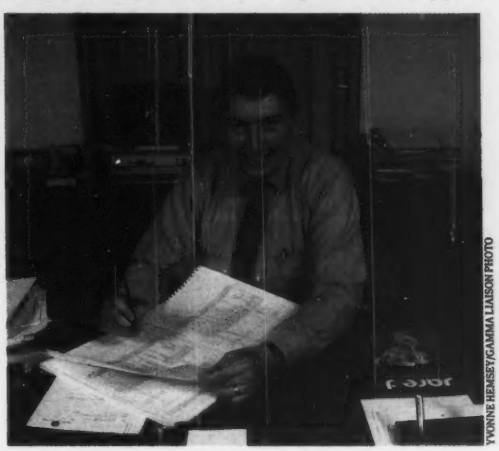
Separating the islands is what Winski terms the "Sea of Credibility." In addition to providing cost benefits, short-term measures help corporate information services build credibility with Warner's business units, he says. "There have been experiences in the past in which people came up with corporate grand plans that never worked out," Winski notes. "The idea of the grand plan has left a bad taste in the mouths of the business units," he claims. As a result, these units want to know what the information services group is going to do for them.

In response, Winski has developed a pay-as-you-go policy, which has two components.

First, businesses pay for any company projects. These projects can occur within a single business unit or may consist of two or more businesses cooperating on a mutual project.

Second, businesses that participate in corporate projects pay a percentage of the costs only if they realize some savings from it.

An example of a corporate



YVONNE HERSEY/GAMMA LIAISON PHOTO

Donald Winski *sets the stage for information services success.*

Hurst is *Computerworld Focus*'s senior writer.

project is one in which the corporate office may sponsor and invest in some new area of technology. "This puts the risk on the corporation rather than the business units," Winski explains.

Warner has made a list of 15 to 20 short-term projects aimed at reducing its telecommunications costs, Winski reports. From this list, he says, "Warner has identified an opportunity to save about $500,000 annually." Some of the projects are corporate plans; others are suggestions for company measures. One corporate project consists of using a long-distance carrier to take advantage of the discount structure that many telecommunications companies offer.

"You can get savings of 10% or higher with AT&T's Proamerica program," he notes. "I understand U.S. Sprint and MCI Communications Corp. provide similar discounts."

Other projects on the list, which has been distributed to Warner's business units, are issues for the units' management.

"There are ways to cut down on credit card abuse and to prevent employees from calling a Dial-A-Joke-type service," Winski comments. Also, a business unit can determine the extent to which employees can use company phones for personal calls. However, while this suggestion is included on the list, headquarters does not attempt to regulate policies on personal calls, he says. "We leave that up to the business units," Winski says.

Benefits of a common line

A more medium-term goal involves establishing common communications lines between offices on the East Coast and those on the West Coast, Winski says. "We have several businesses on both coasts, each with its own leased lines," he explains. "With a common line, we can benefit from economies of scale and get a higher bandwidth." The common line may also provide the business units with better backup and recovery because the corporate office can develop a contingency network plan that the individual business units would not be able to afford themselves.

Warner's long-term plan is to develop networks that conform to an acceptable international standard, Winski says. That standard will probably be the International Standards Organization's Open Systems Interconnect (OSI) model because all the major computer vendors will eventually comply with OSI, he states. However, he notes, "Where we wind up is easy enough to describe, but there is a question as to how we will get there."

Currently, Warner finds that batch processing is usually an acceptable method of communication among mixed information processing technologies, Winski says. "For example, we can set up an ASCII data file and just transmit using packet-switching networks." As Warner shifts from a batch to a more on-line processing approach, Winski foresees a problem unless there is a standard everyone involved can accept. "In effect, we have to wait for vendors to comply." Winski is not worried, though. OSI, which will support on-line transactions, will be available from vendors in a year or two, he says. "By the time OSI is here, we should be ready to use it," he explains.

In a multinational company such as Warner, some data communications will never require on-line processing, Winski says. "Worldwide, most businesses can't have all on-line transactions," he explains. "A company may split its computer time into 12 hours for on-line and 12 hours for batch."

Instead, a business unit in a country that is eight or 10 business hours away from corporate headquarters needs to use store-and-forward processing, Winski says. A processor captures the data on-line locally, stores it and then forwards it later in a batch transaction to the corporate computer system.

For such international communications, the parent organization needs cooperation between companies to use packet switching. Gateway standards are also important because many countries use information processing products from different vendors, Winski says. These gateways provide a solution to the problems caused by sundry data formats and hardware platforms, Winski says.

Management issues

Beyond the technical demands fostered by international offices, there are also management issues to consider, Winski says. One issue is language. Like many multinational companies, Warner uses English as a common language. For office communications, employees use their native language, but they use English to communicate to offices abroad.

Another management issue is understanding a foreign nation's business culture. "Unless managers have international experience, they should rely on people who do [have that experience] to negotiate transactions," Winski advises.

The classic image of the ugly American pervades in international business because some U.S. managers are not experienced in the thinking of other countries and may make a lot of mistakes, he says.

Even a manager experienced in foreign business practices can benefit by enlisting a local representative to set up an overseas network. Many European countries have Postal Telephone and Telegraph (PTT) authorities, a generic term for monopolistic telecommunications firms, Winski explains. Because these organizations lack competition, the lead time for implementing a network takes longer.

CORPORATE ACCOMPLISHMENTS

lowever, he says, "A foreign representative may have contacts in the PTT's 'old-oy' network and may be able to speed up he process."

With Warner's multinational, decentralized structure, "flexibility is key to managing the business," Winski asserts. The same principle holds true for managing technology. As the corporation's needs change, Warner divests or acquires different businesses. Acquired businesses generally have their own computer systems, and they need to communicate with Warner's offices, Winski notes. "As we acquire businesses, we normally don't ask what brand of computer they use," he adds, jokingly.

As a result, Warner's information services need to respond to changing communications needs.

"Having run a business unit myself, I know what type of management turns me off and what turns me on. Business managers like the idea of information services providing value-added services rather than exerting control."

DONALD WINSKI
WARNER COMMUNICATIONS, INC.

Warner tries to avoid centralizing too much of its resources, Winski reports. "We develop alternative scenarios for setting up resources for business units," he says. By examining these scenarios, the firm tries to find solutions that will work in various situations. "We shy away from the solution that offers peak performance for one particular situation because that optimum is based on knowing where the company is going to be," Winski notes. To adapt to the changing corporate environment, he says, "we go for a broad plateau that offers a high return on investment for many situations."

For Winski, an important management issue is balancing the needs of the business units with those of the stockholders. The key to providing information services for working in a decentralized business is to remain nonbureaucratic. "The information services group emphasizes a collegial, partnership role. It's the only way to get things done," he says.

"Having run a business unit myself, I know what type of management turns me off and what turns me on. Business managers like the idea of information services providing value-added services rather than exerting control," Winski claims.

This advisory role accounts for 99% of corporate information systems' responsibility. "The flip side is that as part of corporate management, the other 1% is our responsibility to the shareholders." In this respect, Winski and the information services division function as overseers.

Winski's dual responsibility to the businesses and the shareholders governs his interactions with the units.

If a business unit is mature, Winski usually works with that organization's chief information executive (CIE), who is considered part of the management team, he says. "Warner also has senior corporate executives with oversight responsibilities to one or more business units, and I'm in continual contact with them as well," he notes.

In both corporate and business unit management, Winski says he acts as an ombudsman and advisor; he may tell one business unit CIE concerned about a problem how another CIE successfully solved a similar problem. "Sometimes I bring two CIEs together because I think they can work together," he adds.

If a business unit is still in the early stages of its technology evolution, Winski reports that he deals primarily with senior executives of that unit. "If there is a DP manager in this evolving organization, we'll try to grow the person to do the job of a CIE," he says.

Creating a CIE from a DP manager is easier if the person has a strong base of business experience, Winski notes. "We can teach someone who knows the business about the technology," he says. "It's harder to grow someone who only has a technical background, although it is possible."

Hiring from within

Finding experienced CIEs is generally not too difficult for Warner, however. "Our business units are very stable," Winski notes. "The senior executives have built their own staffs so we can normally find a DP executive from within who knows the business."

Another management issue for Winski is handling a power shift in information processing. "The biggest challenge to information executives is that telecom and MIS are becoming highly user-driven environments," he says. With the spread of user-friendly technology, users have found they no longer need a middleman, Winski explains. In addition, users have discovered that personal computer technology offers them a strategic advantage in business.

As a result, users are much more conversant with and are no longer fearful of the technology, Winski notes. "Before, the CIE was a high priest bringing religion down to the natives," he recalls. "Today, the natives know more than MIS." ❖

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PCs and IOS: Within arm's reach

MIS gains control in micro territory

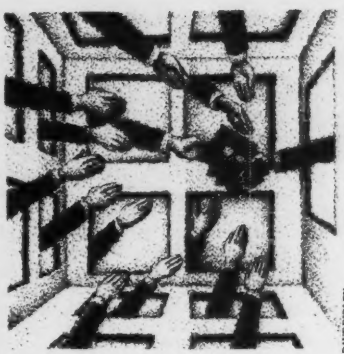
BY STAN KOLODZIEJ

No fuss, no muss. No more unauthorized micro software. No more unsightly, jerry-built micro-to-mainframe links. Smooth communications.

Picture systems like big vending machines, doling out software to users in an orderly, timely manner. Their applications are built in and generally safe from user tampering. No more headaches from updating personal computer software one machine at a time; all software can be updated simultaneously. Files can be automatically backed up. Security is part of the package. Communications are taken care of. No, these systems are not available sometime in the future. They're here now and have been for some years.

Integrated office systems (IOS) are the essence of controlled growth in corporate communications information systems. And that's still a refrain many MIS managers love to hear.

IOS integrate services that are normally found separate in the computer marketplace. According to Framingham, Mass.-based research firm International Data Corp., a typical IOS cross-section would consist of a configuration of hardware, software and communications that enable a user to gain access to and manipulate a variety of information types, such as text, spreadsheets, graphics and, eventually, voice and image, in an "organized and timely manner." A fair enough description but awfully generic.



DAVE RIDLEY

The IDC definition points out the problem that, although there is a lot working under the surface of IOS, the fact that they incorporate so many elements makes IOS hard to categorize. This shortcoming might be one of the reasons IOS have garnered such a small amount of press during the years. IOS have motored along, making corporate inroads, changing the face of corporate computing — but they have been doing it quietly.

However, IOS have not suffered from this lack of media attention. On the contrary, IOS surged ahead in 1986 and tallied a 76% gain in U.S. installations over 1985, which was also a good year for the technology. Despite analysts' positive predictions for this year and 1988, the palmy days of 1986 are unlikely to be matched in the short run, according to IDC.

The recent success of IOS is not shrouded in mystery. The years 1985 and 1986 were unique in U.S. corporate computing. In those days, several larger U.S. corporations were still reeling from the hand-to-hand combat they experienced with corporate micro users in the early '80s. In many locations, war-weary MIS tried to regroup and regain some information systems ground lost to users. At the very least, MIS was trying to place its signature on the blueprint of a fast-changing computing landscape that some information processing professionals felt was quickly slipping away from them.

IOS seemed ready-made for this environment. IOS were communications grids that could be slipped over corporations to link users and departments. Furthermore, these systems could also be controlled from a central minicomputer or mainframe source. But there was a trade-off. Where IOS offered MIS much in the way of convenience and economies of scale, it gave little in the way of individuality in personal computing.

To many in MIS, however, the price was right. What IOS forfeited in the way of creative, customized computing, they more than made up in stability. And this was during a period when the options underlining the growth of corporate personal computers were not as defined as they are today.

It should be made clear that IOS are not that new. Certain systems, such as Digital Equipment Corp.'s All-In-1 and Data General Corp.'s Comprehensive Electronic Office (CEO), two major IOS players, have been around for several years. Others are only a year old.

Kolodziej is *Computerworld Focus*'s senior editor.

But no matter what their age, IOS seem to fit most snugly within those installations reflecting an MIS concern for control.

"We have a large Wang Laboratories, Inc. Wang Office IOS," explains John Wheeler, director of MIS at W. R. Grace & Co. in New York.

"The whole idea of floppy disks and individually upgrading software is a pain. The power users like the IOS because they can get to the more powerful software on the system. Novices like it because the IOS eases them into computing and gives them a lot of Help keys. I like the IOS because it's standardized on certain communications hardware and software," Wheeler says.

"I think you really have to believe in a three-tiered [mainframe, mini and micro] processing theory to get these integrated systems to work," he claims. "Otherwise, you could be frustrated."

According to Mary Ellen Bradley, acting information systems manager at the Department of Game in Olympia, Wash., "We've always had a centralized concept of computing. Prime Computer, Inc.'s [Office Automation Center] system was an extension of that. We looked at the possibility of cabling users directly to departmental minicomputers but decided that we couldn't grow as fast as we could with the IOS."

Jo Ann Miller, assistant director of information services and planning at the Provident Mutual Life Insurance Co. in Philadelphia, says the firm will eventually expand its DEC All-In-1 pilot project to include all headquarters staff.

Starting from scratch

"We now have 45 people on the system," Miller says. "We were in a bit of a unique situation, however, because we didn't have a lot of machines from numerous vendors to start with. That enabled us to start from scratch, working from the top down, putting a corporatewide system into place right from the start. We feel this is going to make it alot easier later to incorporate smaller local-area network [LAN] systems into our overall plan. I think most corporations work from the bottom up. That would have been a mistake with us."

Another factor that Miller says swayed the company toward an integrated system is its future ability to provide for Provident Mutual's upper level management.

"We see DEC VAXs and All-In-1 as the platform to get future executive information systems to our management. If it seems we've done everything a little unorthodox, it's consistent with our [MIS] philosophy to control our growth," Miller explains.

IOS can be comforting because of their proven capability. "We looked at PCs and networking and decided we were growing too fast to try and put separate [LANs] in piecemeal," explains Robert Shaw, vice-president of MIS at Atlantic Recording Corp. in New York. "We also had reservations about the quality of software on LANs."

Instead, Shaw decided to install a 100-user DG CEO system, driven by the vendor's MV/20000 and MV/10000 minicomputers. "I think we're bringing all the departments around [to accepting the IOS]," Shaw adds. "They see the advantages of not having to jump around from machine to machine to update micro software."

One of the biggest IOS functions and a growing factor behind the success of IOS is the increasing number of built-in communications links these systems bring to the table.

"An IOS can lower the cost of linking users together," explains Chris Stone, manager of the office software group at DG. "The cost per user increases substantially with LANs because you need a LAN server and networking software and hardware. Alot of overhead is created. You know that there are only an average of three to five users per LAN out there, only tiny pockets of users connected to small servers. IOS can provide a powerful server or gateway bus to mainframe data bases and, beyond that, outside to long-haul services. That's tough to do with LANs," he says.

According to Provident Mutual's Miller, "We just find that All-In-1 has everything we need. "We can hot-key to get a PC out of the system back into standalone mode. PCs and [DEC] terminals are connected through RS-232 ports over existing phone wires, so we haven't had to buy any new wiring. The DEC terminal servers sit on an Ethernet backbone network. From there, we use the micro-to-mainframe link to get into the IBM [Systems Network Architecture] network and to our IBM mainframe."

Lee Dillon, first vice-president of Sovereign Financial Corp. in Norfolk, Va., and an IBM Distributed Office Support System (Disoss) user, says the firm has all the IOS pieces with Disoss, except one important thing.

"Our people not only want to communicate but also want to manipulate information," Dillon says. "We can't do that with Disoss, so we're looking at some fourth-generation languages and artificial intelligence to build it ourselves."

The W. R. Grace Wang Office installation, which Wheeler envisions as having 16,000 users by 1991, is part of an intricate web of both short- and long-haul communications, servicing users ranging from support personnel to top executives.

"We saw all this coming," Wheeler says. "We knew we were going to expand quickly in information systems and communications, so we made sure our groundwork was solid. It came to a head; either we had to go with IBM's Disoss and [Document Interchange Architecture] using the mainframe as a gateway, or we had to go with Wang Office or some other IOS out there. We decided that Wang Office was a little easier to get into than some of the other systems. Also, Wang's top management assured us that a gateway to the IBM mainframe would be coming soon."

To some extent, the IOS steam engine is being stoked by the litter left behind from the broken promises of LANs and PCs.

He says Disoss was excluded from consideration because the IBM System/38s at W. R. Grace had little office automation software to offer. He adds that one of the 13 W. R. Grace divisions did go with IBM's Professional Office System (Profs), but Wheeler says he feels that Profs appeared before the big push to integrated systems started and, as a result, lacked word processing.

Along the way, W. R. Grace has installed 24 Wang CPUs, ranging from the tiny Wang VS 6 to top-of-the-line Wang minis. Wheeler has tied all the divisions together with X.25 public packet-switching lines.

"I think X.25 is ideal for us," Wheeler says. "It's simple to use, much better than dial-up or private networks or going through a mainframe. I know a company in the UK that has to go through a mainframe to send a message from the third floor to the first floor. It's easy to produce communications overkill with an IOS. With our system, the 24 CPUs can be communicating with each other simultaneously. And they need to; we've figured W. R. Grace generates 8 million transactions a day."

IOS are not static. They change during the years. One big difference between early versions of IOS and current versions is the convenience with which users can both engage and disengage their IBM Personal Computers from the IOS networking scheme.

The early emphasis that saw IOS vendors trying to leverage their system sales by locking users into vendor terminals and proprietary networking and software was quickly overruled by MIS, which wanted PCs plugged into an IOS to keep them under hand and assuage user demands. IOS vendors scrambled to provide PC connections.

IOS have changed in other ways. Originally known for their common denominator approach to applications, in which they provided little in the way of customization for individual programs, most IOS now offer enough programming utilities for even power users to stretch out and experiment.

To some extent, however, the IOS steam engine is being stoked by the litter left behind from the broken promises of LANs and PCs.

Though the multiuser software most IOS offer is underutilized and often plagued by slow IBM Document Content Architecture (DCA) conversion methods, it is available and ahead of most LAN network multiuser software.

Though IOS data base access among PCs, minis and mainframes is inconsistent, it is still more transparent to the user than most stand-alone micro-to-mainframe links.

Though there is much room for improvement in the IOS integration of graphics, word processing, and spreadsheets, there is little available in the LAN arena that can match what IOS already offer. Many IOS also leave bandwidth for future image and voice communications.

Though IOS are coming slowly around to the 20th century with advances in graphics interfaces and good minicomputer-based windowing software, the standard input device is still the keyboard. Few IOS vendors offer mouse or touch screen. Lack of imagination with input methods, however, are countered by the ability of IOS to give users common interface and communications standards. That keeps users current and cuts training costs. LANs are not always so accommodating.

With the upswing in IOS sales and competition among IOS vendors increasing, there are more opportunities for third-party software developers to integrate their products with IOS. IOS vendors are throwing business to third parties to try and add value to their IOS and hopefully distinguish their products from those of competitors.

Third-party bonanza

One clear winner in the third-party sweepstakes is Natick, Mass.-based Access Technology, Inc., maker of 20/20, a multiuser spreadsheet modeling program.

Because of its portability and data import and export facilities, 20/20 can be installed over a range of micros and minicomputers. This ability to work in a networked multiuser, multivendor environment has made 20/20 a natural for IOS, a fact not lost on Wang, Prime, DEC and others that now offer the product with their systems.

In most cases, 20/20 is replacing generic IOS spreadsheets, which can be dreadful. The fact that 20/20 can be integrated with electronic mail also doesn't hurt the product. Some IOS vendors are finding that modeling spreadsheets are finally weaning users away from their beloved Lotus Development Corp.1-2-3 spreadsheets, which is not an easy task.

"Our users are jumping on 20/20," says Phil Dowlin, director of MIS at Midcon Services Corp., an energy resource firm in Houston. "Wang Office didn't have anything like it before."

Sometimes it is not just a separate IOS program that has third-party origins. Chances are if you look closely at Unisys Corp.'s Sperrylink IOS and compare it with a Hewlett-Packard Co. Personal Productivity System, for example, you might be able to detect a familiar flavor among the various integrated software packages.

IOS deja vu

It is no mistake. Quadratron Systems, Inc. in Sherman Oaks, Calif., has been busy the past two years becoming the primal element in the IOS Unix OEM market. The company's Q-Office series of integrated software packages are written in the C programming language. Quadraton has used the fluid portability of C to channel Q-Office into the Unix OEM market. The result is that parts of Q-Office are being used by several mainline IOS vendors to strengthen their own IOS offerings.

"Our Sperrylink contract provides Unisys with a version of Q-Office that extends Sperrylink services," explains Karl Klessig, Quadratron chairman.

Though Klessig confirms that Quadratron is under contract to provide the same services to other IOS vendors, he is also under obligation not to disclose details about those contracts. Klessig's point is that if you look under the hood of many current IOS vendor products, you will be looking at Quadratron software engines and probably not be aware of it.

Such arrangements can be lucrative. Teamed with Quadratron software, Unisys recently won a $250 million contract with the U.S. Army.

IOS must be doing something right, because more MIS managers are turning to them. As always, however, the proof for MIS is in the payoff.

"There is a point of mass criticality when the savings with IOS become apparent," Wheeler claims. "We now have 60% to 80% of our users on the IOS. It's a simple equation. People who have reached critical mass have also reached new productivity levels." ❖

ISDN in an SNA world

BY JOHN PICKENS

The Integrated Services Digital Network (ISDN) holds the promise of an all-digital network from the subscriber's premises through to the transmission network. In addition, ISDN provides the base for a family of advanced voice and data services.

For corporate users, ISDN technology offers a wide variety of benefits compared with conventional methods of voice and data networking. These benefits include increased integrity of data, higher transmission speeds, utilization of common transmission services and wider access to services. According to Tony Stanley, manager of ISDN applications development at Northern Telecom, Inc., a vendor that supplies ISDN products, "The unifying force of ISDN will permit more effective communication among companies, customers and suppliers."

Because of IBM's pervasive presence in the corporate marketplace, corporate users' acceptance of ISDN hinges on acceptable solutions to the connectivity problem with IBM systems. Considering the suite of Big Blue products, connectivity hinges upon support of IBM's Systems Network Architecture (SNA).

IBM has stated it intends to support ISDN in its computer products and has participated in ISDN field trials in the UK and Belgium, with trials scheduled for Germany this year. However, IBM has provided little technical guidance about how to support ISDN. Fortunately, effective ISDN access is possible today using pre-ISDN interfaces in existing IBM products.

The connectivity issue is complicated by the ambivalence of some manufacturers concerning how best to provide access to the IBM environment. Some vendors provide the cheapest alternative with minimum function. Others provide full-function access to IBM system services. Still others adopt a wait-and-see attitude or adhere to the International Standards Organization Open Systems Interconnect (OSI) standards.

Users struggle to unite the two schemes

LES KANTUREK

Rapidly advancing technology is another factor that complicates connectivity options. In the workstation area, for example, processor power is increasing with the existence of Intel Corp. 80286 and 80386 microprocessors, memory is increasing and operating systems are offering more functions. In addition to ISDN, an ever-growing array of local-area network (LAN) alternatives are becoming available.

Providing counterplay to the rapidly advancing technology trends are a collection of competing standards for operating systems, such as Microsoft Corp. MS-DOS, IBM's OS/2 and Unix, and intersystem networking protocols, such as SNA, Transmission Control Protocol/Internet Protocol (TCP/IP) and OSI. The new technologies provide greater opportunities for these competing standards; because of increased available memory capacity and bandwidth, these standards can coexist in many cases.

One of the most effective ways to support the IBM connectivity requirement is to implement SNA in all attaching devices as a native service. Several users are beginning to test this approach in ISDN field trials in the U.S.

Since early this year, U.S. West's operating companies, including Mountain Bell and Pacific Northwest Bell, have been sponsoring field trials of ISDN equipment. Although IBM has not played a visibly active role, the trials are testing various methods of achieving connectivity with IBM systems. Users include the Arizona Department of Transportation and Department of Administration, both located in Phoenix, and the U.S. National Bank of Oregon in Portland.

Pickens is director of communications architecture for San Jose, Calif.-based Communications Solutions, Inc., a manufacturer of IBM SNA-compatible data communications software for vendors and Fortune 1,000 companies.

The purpose of the U.S. West field trials is to test numerous configurations and connectivity approaches. The vendor equipment used in the trials includes switching and networking equipment from Northern Telecom, AT&T and GTE Corp.; SNA front-end communications controllers from IBM and NCR Comten, Inc.; IBM 3270 cluster controllers from AT&T and ITT Courier, Inc.; IBM PC-compatible 3270 emulation adapters and software from Northern Telecom and NCR Corp.; and ISDN terminal adapters from Northern Telecom, Amdahl Corp., AT&T, Fujitsu America, Inc., Codex Corp. and NCR Comten.

Users and planners are testing methods for obtaining interactive 3270 access to IBM mainframe systems. Some of the questions they are attempting to answer through the trials include the following: Can an economical and effective alternative be found to the traditional approach of coaxial cable and cluster controllers?; Can existing cluster controllers be linked via switched ISDN connections to corporate data centers?; And, can ISDN be used to provide switched connectivity between existing coaxial devices and remotely located cluster controllers?

What they're using ISDN for

In the Arizona field trials, users are utilizing ISDN for applications development, motor vehicle registration, drivers license information, records maintenance and data inquiry applications. The trials are testing both existing 3270-style cluster controllers and PC workstation connectivity. In the U.S. National Bank of Oregon field trial, users are using ISDN for electronic mail, word processing and customer balance inquiry applications. Currently, only PC workstation connectivity is being tested.

Of the connectivity alternatives tested in the U.S. West trials, two are generating the most interest from vendors and users. One alternative uses a stand-alone terminal adapter; the other uses two variations of an integral terminal adapter. Both options run SNA end to end.

Stand-alone terminal adapters, used to map the interface of an existing device into ISDN, can connect 3270 cluster controllers or PC workstations with synchronous adapter cards into ISDN. For example, in the Arizona Department of Transportation's Motor Vehicle Division, IBM 3270-type terminals attached to a 3274 cluster controller can access the ISDN network through one stand-alone terminal adapter. The terminal adapter provides circuit-switched service through to a second stand-alone terminal adapter connected to an NCR Comten 3690 communications processor at the transportation department's computer center.

On the other hand, integral adapters provide direct connectivity into the ISDN network's basic rate interface — or 2B+D — the standard interface to ISDN from customer premises equipment. This interface provides two 64K bit/sec. circuits plus a 16K bit/sec. X.25 signaling channel. Currently, there are no IBM products that support this interface, either for workstations, departmental processors or mainframes.

In the U.S. West trials, two vendors are demonstrating this direct connectivity capability. Northern Telecom features an X.25 packet-switching adapter running 3270 emulation software from Communications Solutions, Inc. NCR features a circuit-switching adapter with 3270 emulation software that it developed. The packet-switching adapter multiplexes multiple sessions onto a single link; the circuit-switching adapter utilizes a single session per link.

Exercising caution

On the host side, some of the trials' managers are exercising caution in switching to new technology in their production systems. In Oregon, for example, 5,000 non-ISDN users share the same facilities being used for the trial. So while the PC workstations are using X.25 to access a Northern Telecom X.25 packet switch, the X.25 inbound to the host, which transmits and receives at 64K bit/sec., is being converted into a 9.6K bit/sec. IBM Synchronous Data Link Control (SDLC) format before being fed to the IBM communications controller. Eventually, the communications controller interface reportedly will be upgraded to 64K bit/sec. using the IBM Network Control Program (NCP) Packet Switching Interface. The NCP Packet Switching Interface is already in production use in the Arizona trials.

The trials are also testing two other configurations. Coaxial cable eliminators are used to attach IBM 3278-type printers or PC workstations with coaxial emulation adapters to ISDN circuits. Asynchronous protocol converters provide access to 3270 services by asynchronous ASCII terminals or PC workstations running terminal emulation software.

Although the trials are in an early stage, users seem pleased with the service they have received. According to Steve O'Connell, a network consultant in the Arizona Department of Administration, "I was impressed with how fast ISDN went up." There are still some expected glitches and problems, however. For example, at peak hours, the Arizona trials reportedly sometimes encountered unexplained degradation in the NCP Packet Switching Interface software on the 3725. However, users say they are satisfied, if not excited, with the ability to run SNA directly over ISDN.

Despite the success of 3270 access

during the trials, issues still exist regarding the preferred method of IBM connectivity.

Bandwidth issue

One such issue concerns bandwidth. In the trials, ISDN's full 64K bit/sec. bandwidth potential has not been utilized. Rather, through rate adaption, users' equipment is limited to 9.6K bit/sec. Users do perceive somewhat slower response times using an ISDN connection when compared with using a cluster controller directly attached to a mainframe channel. That difference could be reduced through access to the full 64K bit/sec. channel bandwidth. However, John Amidon, telecommunications manager for the Arizona Department of Transportation, maintains that the response time difference is not a major problem.

While users expect vendors to utilize the 64K bit/sec. bandwidth more effectively in the future, Amidon raises a question for the near term. "Who is going to be pushing 64K bit/sec.? That is a lot of bandwidth," he says.

Another issue concerns the utilization of the ISDN basic rate interface. The circuit-switching approach has the potential of accessing the full 64K bit/sec. channel bandwidth, but it requires a separate ISDN channel for each circuit. The X.25 packet-switching approach eliminates the need for multiple channel interfaces at the host end. Lee Bryant, ISDN project manager for Mountain Bell, explains that X.25 offers two important benefits: enhanced security through closed user groups and multiplexing of up to 4,095 logical connections on a single physical link.

IBM intentions

By examining where IBM is leading its customer base, one can begin to cull some order from the confusion in communications options and capabilities.

Historically, vendors have viewed supporting native-mode IBM data communications as a risky venture. IBM demonstrated a penchant for releasing incompatible versions of products and running undocumented protocols. Fortunately, that practice has been changing.

IBM is maintaining an increasingly well-focused strategy regarding connectivity and communications through SNA. To put teeth into the process, this strategy is propagated throughout the IBM product divisions via two methods: formalization of a centralized architecture review committee with representation from all product divisions; and sign-off authority within the product release process by corporate architects.

For applications development, IBM further strengthened its SNA strategy by incorporating it into its Systems Application Architecture (SAA). Initially intended for office systems use but eventually expanded for most other applications, SAA conformance is now required for all strategic IBM systems.

This formalization and standardization by IBM has resulted in concrete directions for users and vendors to follow. As a result, it is now practical to support the SNA services specified by SAA as a native-mode service.

In the past, access to IBM systems and applications required only 3270 and 3770 Remote Job Entry (RJE) emulation capability. Today, IBM has added significantly to its set of application requirements so that users now need IBM's Advanced Program-to-Program Communications (APPC), document distribution through Document Interchange Architecture (DIA)/SNA Distributed Services (SNADS) as well as file access through Distributed Data Management (DDM).

If systems utilizing ISDN do not support the full range of SNA services, their marketplace acceptance will be reduced. To assess the adequacy of a given connectivity solution, users and vendors should measure the solutions against the potential for implementing the complete package of architected SNA services.

However, physical connectivity is a lesser aspect of the ISDN connectivity challenge facing users and vendors. Requirements, such as direct attachment to the basic rate interface, remain imperative but must not push other connectivity issues aside.

A potential vendor or user of ISDN must determine what kind of service access is needed within the IBM environment. Access may be desired only to enhance the connectivity options for existing services, especially 3270, or it may be needed to provide full access to all IBM services.

If users require connectivity enhancement, then the vendor need only provide terminal adapters that convert an existing service interface into the ISDN interface. Examples include asynchronous adapters that provide access into 3270 or IBM 5250 protocol converters, synchronous adapters that provide access into SDLC interfaces in existing IBM products and coaxial cable adapters that provide access from 3270 terminals and printers into 3174 and 3274 cluster controllers.

SNA in native mode

If full access to IBM services is the goal, then the vendor needs to implement SNA in native mode. This solution is IBM's direction and is represented in its OS/2 Extended Edition operating system.

The native SNA approach supports SNA applications and architectures directly, with no translation or mapping. Native SNA can be provided either in a stand-alone or distributed implementation. The stand-alone implementation

contains the upper application and lower network layers of SNA in a single system like a personal computer. A distributed implementation contains the application and network layers of SNA in more than one system, with one system supporting the local users and applications and one system acting as a gateway but not performing protocol transformation, such as a communications gateway in a LAN.

The native SNA approach adds one important benefit that all the other approaches lack — seamless integration into IBM's network management architecture. The ability to manage hardware and software from a central location is high on the list of end-user requirements.

There are alternatives to the native-mode SNA approach. Considering ISDN's genesis in the world of open systems, many would prefer ISDN to be based upon OSI protocols; others would prefer standards based on TCP/IP. However, to be based on one of these models would require transformation gateways into the IBM SNA world. Although it is a promising technology for the future, transformation gateways suffer from the information-loss syndrome. Incomplete access to SNA-based services would likely result, leaving users dissatisfied.

Of the multiple connection alternatives available to the ISDN trial sites, the native-mode method generates the most excitement among users. Only through the native mode can users maintain compatibility with both current and future applications in the IBM environment. According to Daryl Newberry, ISDN project manager for Pacific Northwest Bell, "Our focus is on the transport architecture. It is key that transport services be transparent to the applications." By supporting application transparency, the ISDN trials are able to measure the real benefits of ISDN: lower costs and increased flexibility.

ISDN and IBM net management

Surrounding architected SNA applications is a strong requirement for network management. IBM has defined a formal network management architecture and has supported it with the Netview product family.

The ISDN story misses a big piece in the connectivity puzzle in its method of working together with IBM's network management strategy. It is on this point that the worlds of the common carrier and computer manufacturer collide. Who should provide the overall network management function? IBM's network management strategy is to provide a method of managing systems from one or more centralized locations. As evidence of its commitment to that strategy, IBM introduced in June additional applications running under Netview that permit remote management of systems, from turning the power on to software downloading to operational overview.

If users require centralized net management and if ISDN is to be a major component of those networks, then IBM and ISDN systems require a management interface between them. However, that interface has not yet been defined. But when such an interface is available, it will likely be implemented as a network management application running under Netview. ISDN vendors will have the option of either using IBM's hardware and Netview/PC software or implementing the service point function for network management with SNA as a native-mode service. It is unlikely that IBM will modify its network management architecture to come under the control of ISDN network management.

Plans for the future

Even with only preliminary results available, users and vendors are beginning to plan the next steps for IBM system connectivity. In the near term, many say they will support more IBM terminal emulation products, with 3770 RJE and System/36 and 38 access using 5250s high on the list. The 3770 RJE provides access to IBM's batch processing services and serves as a form of bulk file transfer, while the 5250 provides access to System/36 and 38 departmental processors.

One area of additional experimentation will be in utilizing X.25 packet switching. On the host link, for example, X.25 can be used to support access not only from ISDN equipment but also from other X.25 equipment attached to pre-ISDN networks. Mountain Bell says it plans to test a combined 3270/3770 SNA package for a PC workstation that accesses a host through an intervening Siemens AG of North America, Inc. packet-switching network, X.75 gateway, Northern Telecom DPM-50 packet switch and NCR Comten front end running X.25 boundary node software.

If the trials are successful, the path will be cleared to test other IBM applications. APPC/LU6.2 would provide access between applications on workstations, departmental processors and hosts. DIA and SNADS would provide document distribution and electronic mail. DDM would provide file and data base access. These applications will all require native-mode SNA in the attached devices.

For IBM connectivity, ISDN is purportedly a way of eliminating coaxial cables and achieving wide-scale data distribution. According to Arizona Department of Transportation's Amidon, "ISDN is here to stay. Users and vendors have to look carefully at what ISDN is used for. The key to acceptance has to be standards." And for ISDN to work in the IBM world, that standard is IBM's SNA. ❖

products

TECH TALK

Network communications with a von Neumann twist

By Michael Tucker

There is probably no single area of commercial computing today that's as active as communications. Whether you're talking micro-to-mainframe links, local-area networks (LAN), wide-area networks, RS-232C-based systems, integrated voice/data, Integrated Services Digital Network or network management — communications appears to be hot.

Care for some examples?

A press kit from Cambridge, Mass.-based BBN Communications Corp. announces that the company has just introduced the C/3R Packet Switching Node (PSN), "the first member of BBN Communications' tactical packet-switching product family."

In case you're interested, "tactical" means that the C/3R PSN is a packet-switching node designed to survive in the midst of bullets, artillery fire, radiological weaponry, nerve gas and all the other tools of modern combat. So, if you're MIS installation is under fire from management, give BBN a call.

Firms roll out communications tools for the Apple Mac SE, page 52.

Just to prove that the private sector is not to be outdone in communications innovations and press heraldry, a commercial consortium made up of British Airways, KLM Royal Dutch Airlines, Swissair and Covia (a subsidiary of United Airlines) sent a polite note saying that it has launched a joint computerized information and reservation system. The system reportedly will handle an estimated 75 million travel arrangements annually by the year 2000.

And there's more

And, mind you, these examples do not even mention the other materials that have made their way into my hands. There was also a loose-leaf folder from the Corporation for Open Systems, a bound notebook from IBM regarding its networking strategy and documents from Sun Microsystems, Inc. about its Network File System.

However, amidst the activity in the communications market, one analyst does not see any reason to become excited.

In a recent interview, Will Zachmann, vice-president of research at International Data Corp. in Framingham, Mass., made a surprising comment: "Traditional telecommunications aren't where it's at anyway. The network of the future, the one that matters, is a network where you use the LAN as a sort of extended system bus, . . . where things work off it almost as plug-in cards work off the PC bus in a personal computer."

A revision at hand

That kind of talk assumes a fundamental revision of the way the industry perceives data communications. In fact, this viewpoint rewrites the term "data communications" so that it becomes "data-and-instruction communications."

Call it the von Neumann revolution; just as von Neumann recognized that data and commands could be considered one and the same on a digital computer, so, too, could modern networkers combine communications with processing.

It's a pretty image and one that has been proposed before by a number of different analysts. The combined communications/processing net image is also immensely flattering to communications officers because it would greatly increase their power within corporate computing. Is there, though, any hard evidence to support this image?

Perhaps. In recent months, a number of curious incidents have occurred. Consider IBM. IBM has introduced three separate LAN products: PC Network, Token-Net and Token-Ring network.

As little as two years ago, it was widely believed that those three products would define IBM's communications hardware offerings and that IBM would dominate LANs as completely as it currently rules the mainframe world. Independent LAN makers, like Novell, Inc., would fade from the scene.

More recently, IBM began publishing specifications for

Continued on page 54

PRODUCT CLOSE-UP

IBM extends Netview

IBM recently has been deluging the market with extensions of its Netview network management software.

The latest Netview product announcements included Netview Release 2, a facility that enables users to set up single control centers and manage both IBM Systems Network Architecture (SNA) and non-SNA networks. IBM added that Release 2 also allows users to control the operation of local and remote IBM 370s.

At the same time, IBM announced Netview/PC Version 1.1, an enhancement of the Netview Communications Network Management services that supports IBM local-area networks and non-SNA, non-IBM communications devices.

Netview Release 2 offers such capabilities as automated operation, operating system operation from Netview consoles that are local or remote and the ability to start and restart IBM's VTAM and VTAM applications. Customers reportedly can run Netview Release 2 unattended in distributed IBM VM or VSE environments.

Netview Release 2 reportedly can manage both SNA and non-SNA nets.

"Release 2 is an extension of the quest for more mainframe network management control that Netview represents," said Jack Musgrove, associate director of telecommunications at Dataquest, Inc., a research firm in San Jose, Calif.

Features of Netview/PC Version 1.1 include forwarding of SPCS Netview commands to applications, support of V.24 and V.25 bisynchronous line-switching protocols for international customers, an option to run host

Continued on page 52

BLUE BEAT

A bundle of woes

Deidre Depke

IBM's strategy to tie its small-, medium- and large-scale machines together through the Communications Manager in OS/2 Extended Edition is causing some controversy among a few communications and data base software companies.

IBM is guilty of bundling in its OS/2 Extended Edition, charges Martin A. Goetz, senior vice-president of Applied Data Research, Inc. (ADR).

Goetz is serious enough to raise a major fuss. He says he plans this month to present a formal position paper on his charges to ADAPSO's board of directors.

Third-party difficulties

Goetz claims that by incorporating data base and communications software functions into the OS/2 Extended Edition, IBM is making it difficult for third-party data base and communications software firms to compete.

"There is no technical reason why IBM couldn't have built the two pieces separately," Goetz says. "It doesn't make the source code available to other companies, which is going to make it very difficult for third parties."

Goetz has experience in this issue. He was the originator of bundling charges against IBM in the 1960s, when IBM sold computers with an operating system and other software included. Goetz charged then that IBM was excluding third-party suppliers, and in 1969, ADR sued IBM for monopolizing the software marketplace. IBM settled with ADR for $2 million and announced soon afterward that it

Continued on page 53

Neural net coprocessor bows

In a display quite different from the run-of-the-mill networking technology, San Diego-based Hecht-Nielsen Neurocomputer Corp. unveiled in July its Anza 386 neural network computer.

Neural networking is a relatively new and little-known technology that attempts to make computers as similar to the human brain as possible. Neural network advocates — called "connectionists" — say they believe that computers will only act like brains when they are built like brains. Connectionists hope to build machines that would be composed of thousands, or even millions, of tiny processing elements that could be massively interconnected in much the same way that neurons are massively interconnected in the brain.

In a neural network system, software would be composed of unique sets of relationships between individual neurons, while an application would be a network of these neural connections.

Experimental neural network machines have already shown the power to recognize some patterns, learn from experience and recognize speech and even faces. Connectionists claim that neural network machines could be the best possible interface between human beings and conventional computers.

However, neural network hardware is still confined to the laboratories. In the meantime, connectionists work with software simulations of neural networks running on conventional computers, which range from personal computers to supercomputers. In the last year, a new industry has appeared to supply neurocomputers with coprocessors that perform the mathematically intensive job of network emulation.

A neurocomputing pioneer

Hecht-Nielsen was one of the first companies to offer a neurocomputer product based on a personal computer. Its flagship product, the Anza Coprocessor AZ500, is based on the Motorola, Inc. 68020 and costs $9500.

Hecht-Nielsen's Anza 386 is a complete neural network development workstation composed of the Anza coprocessor and a Zenith Electronics Corp. IBM Personal Computer AT-compatible using the Intel Corp. 80386 microprocessor. Total cost for the workstation, with a library of neural network software is $19,500.

Hecht-Nielsen is said to have considerable stature among connectionists. The firm was founded by Robert Hecht-Nielsen, who formerly led the neural network program at TRW Electronic Systems Group in Redondo Beach, Calif. TRW was one of the first large U.S. companies to enter the field of neural networking and still may be the largest player. TRW's applications of the technology have been primarily in pattern recognition for military systems.

In fact, Hecht-Nielsen's primary product is its expertise as much as its hardware. The firm's seminars are in as much demand as its products. At the same time the company introduced the Anza 386, it also announced a new week-long course on neural networking priced at $965.

With or without the week-long seminar, the Anza 386 entered a market that is becoming crowded. At the first International Neural Network Conference in San Diego last June, several firms displayed network emulator boards. These exhibitors included such market leaders as Dallas-based Texas Instruments, Inc., which was touting its Odyssey digital signal processing board as a network emulator, and San Diego-based Science Applications International Corp., which had a similar signal processing board. — MICHAEL TUCKER

Circle Reader Service Number 145

Avatar, DCA offerings back Mac SE

Software packages provide IBM terminal emulation

The Apple Computer, Inc. Macintosh SE shows signs of contributing to the popularity of Macintosh products in the corporate environment. In response, two vendors — Avatar Technologies, Inc. and Digital Communications Associates, Inc. (DCA) — have introduced communications devices for the Mac SE.

Hopkinton, Mass.-based Avatar was an early developer of IBM 3270 emulation devices for the Macintosh. Working with Apple, Avatar has rolled out a board-level version of its Macmainframe external emulation device for the SE. Macmainframe SE is an internal card software package that allows the Macintosh SE to connect directly into a 3270 network.

A coaxial connector that extends from the Mac SE's access panel can attach to an IBM 3174, 3274 or 3276 control unit or an IBM 4300 series display printer adapter. The software provides full IBM 3278 Model 2 terminal emulation.

The primary advantage of Macmainframe SE over the external Macmainframe device is speed, according to Doug Rivkin, an information center analyst at Fidelity Systems Co., a Boston subsidiary of Fidelity Investments. "Macmainframe SE is at least twice as fast as Macmainframe," said Rivkin, who has tested both products.

Alpharetta, Ga.-based DCA, best known for its Irma 3270 emulation products for IBM Personal Computers and compatibles, has unveiled Macirma. Macirma's 3270 functions and feature set are based on the E78 Plus emulation software DCA developed for its Irma 2 products.

Like Macmainframe SE, Macirma includes an add-on board and emulation software. Macirma emulates both IBM 3278 and 3279 terminals

Avatar's Macmainframe SE is currently available for $795. DCA's Macirma, in versions for the Macintosh II and SE, is priced at $1,195 and expected to be available in early fall 1987.

Because the Macintosh SE is basically a closed-architecture box, users must have either the Avatar or Macirma boards installed by authorized Macintosh dealers. — REBECCA HURST

Circle Reader Service Number 146

Netview

Continued from page 51

data transfer under the Netview/PC Region Manager and the inclusion of Netview/PC as part of IBM's Systems Application Architecture (SAA).

Musgrove claimed that the SAA facet of Netview is important because SAA will eventually provide a common set of applications interfaces across IBM computers and communications products.

"This will give users the ability to handle network management from a centralized point in mainframe, minicomputer and micro installations," he said.

The question is when this integration will happen.

Musgrove said Release 2 and Netview/PC Version 1.1 are important building blocks in IBM's overall network management strategy, but it could be awhile before enough pieces are in place to make it worthwhile for users.

Monthly license charges for Netview Release 2 are priced as follows: $1,255 for MVS/XA; $1,060 for MVS/370; $940 for VM; and $655 for VSE.

Netview/PC Version 1.1 has a one-time charge of $2,200. — STAN KOLODZIEJ

Circle Reader Service Number 147

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PRODUCT CHECKLIST

Ideassociates, Inc. has announced the **Ideacomm 5251/MC** emulation board, which connects IBM Personal System/2 Models 50 and 60 with IBM System/34, 36 and 38 minicomputers.

Ideacomm 5251/MC reportedly enables the PS/2s to emulate IBM 3180, 5251 Model 11, 5291 and 5292 Model 2 terminals and can be used with either a color or monochrome monitor.

The firm added that 5292 Model 2 emulation enables users to run IBM minicomputer graphics programs, including IBM's Business Graphics Utility.

Ideacomm 5251/MC, at $895, includes hardware and software.

Ideassociates, 29 Dunham Road, Billerica, Mass. 01821.

Circle Reader Service Number 148

Data General Corp. rolled out **CEO Profs Exchange Architecture** (CEO PXA), which enables electronic mail and document exchange between DG's Comprehensive Electronic Office (CEO) and IBM's Professional Office System (Profs) integrated office systems.

DG claimed that CEO PXA converts addresses, messages and documents at the company's MV line operating level, relieving the IBM host of these tasks by off-loading them and reducing customer data processing costs. A CEO PXA mail server reportedly can establish a link to Profs users operating on one or multiple hosts in a bisynchronous or IBM Systems Network Architecture network.

CEO PXA licenses are priced from $5,250 for the DG MV/2000 DC to $10,500 for the DG MV/20000.

Data General, 4400 Computer Drive, Westboro, Mass. 01580.

Circle Reader Service Number 149

Hayes Microcomputer Products, Inc. announced its **V-Series Smartmodem** line, composed of four modems.

The V-Series Smartmodems provide an implementation of the bit-oriented link access procedure link-level portion of X.25 and the asynchronous framing technique to allow point-to-point error control and a migration path to X.25.

The modems also reportedly include adaptive data compression, which can double data transfer and lower transmission costs and connect time.

All four modems are AT&T 103, AT&T 212 and CCITT V.2 and V.22 bisynchronous compatible to communicate with existing modems, according to the vendor.

The V-Series Smartmodem 9600 external modem and 9600B internal modem run at 9.6K bit/sec. and are priced at $1,299 and $1,199, respectively. The V-Series Smartmodem 2400 external model, which costs $899, and 2400B internal model, which costs $849, operate at 2,400 bit/sec.

Hayes, 705 Westech Drive, Norcross, Ga. 30092.

Circle Reader Service Number 150

Digital Communications Associates, Inc. (DCA) has introduced **Windowlink for Irma.**

The Windowlink for Irma software allows the terminal emulation and micro-to-mainframe file transfer capabilities of the vendor's Irma communications product to run as a true Microsoft Corp. Windows application. Running under Windows, Windowlink for Irma reportedly enables the user of a personal computer equipped with DCA's Irma 2 or Forte Communications, Inc.'s Forte PJ to initiate an IBM 3270 host session and emulate an IBM 3278 or 3279 terminal.

The product costs $195.

DCA, 1000 Alderman Drive, Alpharetta, Ga., 30201.

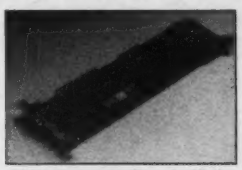
Circle Reader Service Number 151

The **VF-3000 facsimile**, a color video facsimile machine, has debuted from **Color Video Fax.** The VF-3000 is said to support the transmission of color video signals, including television pictures, over conventional dial-up telephone lines.

The Color Video Fax system includes the fax machine, a digital floppy disk drive and color printer. The VF-3000 facsimile retails for $5,600.

Color Video Fax, P.O. 5610, Playa del Rey, Calif. 90296.

Circle Reader Service Number 152



Ungermann-Bass's *Net/One NICPS/2 adapter card*

Ungermann-Bass, Inc. has introduced the **Net/One NICPS/2** Ethernet adapter card, an Ethernet card for connecting IBM Personal System/2 Models 50, 60 and 80 to a local-area network.

Ungermann-Bass said the product's network interface controller (NIC) uses an application-specific integrated circuit (ASIC) semiconductor chip that takes advantage of the speed and performance of the PS/2's proprietary Micro Channel bus architecture.

The firm added that the ASIC chip uses a shared memory architecture to maximize the speed at which transfers between the PS/2 memory and the NICPS/2 on-board random-access memory can take place.

The NICPS/2 costs $495.

Ungermann-Bass, 3900 Freedom Circle, Santa Clara, Calif. 95052.

Circle Reader Service Number 153

Systems Strategies, Inc. has announced **CSNADS** networking software, a Unix-based implementation of IBM's Systems Network Architecture Distribution Services (SNADS).

CSNADS reportedly allows non-IBM computers to asynchronously exchange electronic mail and documents with IBM office systems including mainframes running the Distributed Office Support System/370 under CICS and System/36 and 38 computers running Personal Services/36 and 38.

The single-quantity cost for CSNADS is $400. Volume discounts are available.

Systems Strategies, 225 W. 34th St., New York, N.Y. 10001.

Circle Reader Service Number 154

The **Net-127** local-area network has been announced from **Trans-M Corp.**

Net-127 was designed to connect IBM Personal Computers, PC XTs, ATs and compatibles with IBM's Personal System/2 Model 30 machines.

The product is said to allow all computers on the network to share each other's resources, including software stored on either 5¼-in. or 3½-in. floppy-disk media.

Net-127, including the board, network operating system and a 25-ft telephone cable with RJ-11 jacks, retails for $249.95 per node.

Trans-M, 28 Blacksmith Drive, Medfield, Mass. 02052.

Circle Reader Service Number 155

The Orion Group, Inc. has rolled out the **Orion SNA0123 Facility**, a product that supports terminal-to-host communications over networks based on IBM's System Network Architecture (SNA).

The Orion SNA0123 Facility is said to emulate SNA LU0, LU1, LU2 and LU3. It supports devices that emulate IBM's 3270 and 3770 families of terminals and peripherals as well as IBM's 4700 and 3650 systems used in financial applications.

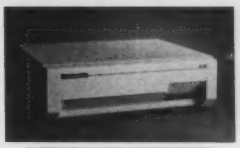
In addition, Orion said that SNA0123 can co-reside on a processor with Orion's SNA62 Peer Communications facility so that users may conduct LU0, LU1, LU2, LU3 and LU6.2 sessions simultaneously over a single communications link.

Orion's SNA0123 Facility is available to OEMs on a royalty basis.

The Orion Group, 1912 Bonita Way, Berkeley, Calif. 94704.

Circle Reader Service Number 156

BBN Communications Corp. has announced the **Advanced C/10 SNA PAD**, a packet assembler/disassembler (PAD). The product reportedly enables IBM 3270 terminal users to switch between IBM Systems Network Architecture (SNA)-supported mainframes and departmental systems.



BBN Communications' *Advanced C/10 SNA PAD*

BBN said that the product supports controller-to-host, peer-to-peer and host-to-host connections.

Prices for the Advanced C/10 SNA PAD start at $9,350.

BBN Communications, 70 Fawcett St., Cambridge, Mass. 02238.

Circle Reader Service Number 157

Soft-Switch, Inc. has unveiled **SNADS Gateway/3+Mail**, a software gateway that enables electronic mail to be sent between 3Com Corp.'s 3System local-area network and IBM mainframes, using IBM's Systems Network Architecture Distributed Services (SNADS).

SNADS Gateway/3+Mail connects directly to IBM's Distributed Office Support System and to the Soft-Switch SNADS Gateway/MVS. Through these mail servers, 3+Mail users can exchange mail with other SNADS-based systems.

SNADS Gateway/3+Mail is licensed between $3,000 and $5,000 per unit, depending on volume.

Soft-Switch, 955 Chesterbrook Blvd., Wayne, Pa. 19087.

Circle Reader Service Number 158

Blue Beat

Continued from page 51

was unbundling software from hardware.

Furthermore, Goetz says because IBM's OS/2 Extended and Standard Editions are not due until at least 1988, the market will be frozen until then.

IBM may have a defensible position on the communications portion of the operating system, Goetz admits, because of certain proprietary ties between the communications software element and IBM machines.

But the issue is far more clear-cut on the data base side, he says, because this market has historically been separate. This allegation is particularly true because IBM does not offer buyers the option of purchasing the data base components separately.

By bundling the three components within OS/2 Extended Edition, IBM is also pushing the idea to buyers that it is in a better position than independent software vendors to provide networking and distributed processing across the personal computer, minicomputer and mainframe tiers, Goetz says.

Not all software vendors agree with Goetz. Ashton-Tate's Chairman Ed Esber says IBM is entitled to market the products together because the Standard Edition is also offered. Esber's view may be skewed by recent market events, however. Ashton-Tate is eager to convince the industry that it can compete effectively against IBM and its strategic partner Lotus Development Corp. no matter what either firm does. But it is likely that there are other companies that share Esber's point of view.

ADAPSO is concerned about the long-term impact of such actions, says ADAPSO Chairman Jay Goldberg, who is also president of Money Management Systems, Inc. "The next thing that could happen is that it'll bundle in an application," Goldberg says. "We're concerned with the competitive threat."

But it is unlikely that ADAPSO will take legal action, claims member Dave Eskra, chairman of Pansophic Systems, Inc. "Our desire is to negotiate our way through this kind of thing," he says. "IBM has more lawyers than the Justice Department."

IBM, which is an ADAPSO member, disputes the charges. "We don't think it's bundling because OS/2 comes out in two editions, Standard Edition and Extended Edition," an IBM spokeswoman says. "You don't have to buy Extended Edition. It's up to the customer whether he wants to use IBM's Extended Edition, someone else's extended edition or build his own. To us, bundling says you're not giving people a choice."

Should the controversy reach the courts, it is likely that IBM will prevail. Granted, the company could have made available to the market on a separate basis the data base and communications components. But as IBM would successfully argue, the technology is proprietary, and IBM needs products to compete effectively against major foes like Digital Equipment Corp.

On the other hand, Goetz has raised several good points that should be taken seriously by independent software vendors. If IBM increasingly begins to market products together, those firms will find themselves threatened. And it is never too early to start thinking about that.

Depke is editor of "IBM Watch," a biweekly newsletter published by IDG Communications, Inc.

Tech Talk

Continued from page 51

SNA and a host of other communications protocols. Again, it was widely believed that these announcements formed the beginning of an era and that within a few years communications outside the IBM universe would be impossible. Alternative protocols would vanish.

Finally, this year, IBM rolled out the Personal System/2. For months before the debut, the industry speculated that the machine would contain secret technology that would allow the PS/2 to link directly to IBM mainframes. This ability would spell the doom of clone makers.

However, none of those predictions have come to pass. Clone makers, LAN vendors and non-SNA communications protocols are doing well. IBM has not forced its everlasting imprint on communications and shows no signs of wanting to do so.

The word is Netview

Instead, this summer IBM began a series of seminars for the press and consultants around the U.S. in which it stressed not networking but network management. The word at those meetings was Netview, an IBM system that allows an individual to control and monitor a network of almost any size that contains both IBM and non-IBM hardware. In particular, the Big Blue boys were showing Netview/PC, the personal computer version of the product.

Networking, even networking with machines from IBM's competitors, was taken as a given. Communications was not exciting to IBM but control of it was.

Could it be that IBM is saying networking itself is not particularly important? It appears as though the company is treating communications in the same way it treated the PC bus — as a means by which third-party suppliers can add value to an IBM product.

Now consider Chelmsford, Mass.-based Apollo Computer, Inc.

For a long time, Apollo's claim to fame was its machines' ability to network. Today, Apollo is not alone in offering a high degree of connectivity. However, Apollo is not merely resting on its networking laurels. According to a press release, David Nelson, the company's vice-president and chief technical officer, "is leading an industrywide coalition to support the computing of the 1990s — network computing and work group computing." (See interview on page 6.)

Note the wording — Apollo is not "computer networking" but rather "network computing." The emphasis is on the network as a device in its own right, rather than merely as the transport mechanism linking different devices.

Finally, let's consider the Software Productivity Consortium, located in Reston, Va. This association is made up of high-tech companies, mostly government contractors in aerospace and related fields, that came together in 1984 to address their common software development problems. The consortium is intended to produce new tools and techniques by which software can be developed more quickly, more efficiently and with fewer bugs.

The common environment in which the consortium says it intends to develop its software is a network called the Intelligent Distributed Resource Processing System (IDRPS). In consortium literature, IDRPS is described as "the network that is a computer" and as "a living system which will evolve to stay at the leading edge of the technology."

Strong language, indeed.

None of these incidents provides proof that Zachmann and other analysts are right when they say we will see the distinction between networking and processing immediately vanish.

But these industry examples do suggest that there is order in chaos. It may be that the representative, common thread to all those press kits is a slow interweaving of systems. This confluence will ultimately produce distributed processing that will seem, in hindsight, to be a logical, orderly and inevitable move.

HOT SEAT

Is there a security system that encrypts information for an IBM-type cluster controller to an IBM mainframe?

Jaime Zartman
Mcdata Corp.
Broomfield, Colo.

Jim Bidzos, RSA Data Security, Inc., Redwood City, Calif., and Thomas Mitchell, ACS Communications Systems, Inc., Reston, Va.: Link encryptors are the most common solution for this type of security. They work between the cluster controller and modem and between the modem and host. These encryptors typically are priced at approximately $2,000 each, depending on the product chosen. ACS and Sherlock Information Systems offer such security wares.

Focus's Hot Seat column consists of product- and service-related questions that you, our readers, would like us to ask a particular vendor.

Call us, toll free, at 1-800-343-6474 if you have a question. Or, forward your inquiries to Lory Zottola, Managing Editor, *Computerworld Focus*, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

CALENDAR

Sept. 13-19

The Sixth Annual Gartner Group Information Industry Scenario Conference. Atlanta, Sept. 14-16 — Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, Stamford, Conn. 06904.

Atre Annual Forum on Data Base. New York, Sept. 14-16 — Contact: Atre International Consultants, Inc., P.O. Box 727, 16 Elm Place, Rye, N.Y. 10580.

Local-Area Networks. San Francisco, Sept. 15-16 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Sept. 20-26

T1 Networking. Washington D.C., Sept. 21-22 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Dataquest, Inc.'s Business and Office Systems Conference. Littleton, Mass., Sept. 21-22 — Contact: Marina Pettijohn, Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

Corporate Microcomputer Exposition & Technical Conference (Corpcon West). Los Angeles, Sept. 21-23 — Contact: Corpcon, P.O. Box 3727, Santa Monica, Calif. 90403.

CD-ROM Expo. New York, Sept. 21-23 — Contact: IDG Conference Management Group, P.O. Box 9171, Framingham, Mass. 01701.

Conference on Software Maintenance — 1987. Austin, Texas, Sept. 21-24 — Contact: The Computer Society of the Institute of Electrical and Electronic Engineers, Inc., 1730 Massachusetts Ave. NW, Washington, D.C. 20036.

Fifth Annual 1100 Data Center Management Conference. San Diego, Sept. 22-25 — Contact: DCM Conference, Datametrics Systems Corp., 5270 Lyngate Court, Burke, Va. 22015.

The Fifth Annual NCR Users Eastern America Conference. Fort Washington, Pa., Sept. 24-25 — Contact: Frank Whalon, Tinius Olsen Testing Machine Co., P.O. Box 429, Willow Grove, Pa. 19090.

Sept. 27-Oct. 3

Using Dbase III Plus Advanced Techniques and Networking. Philadelphia, Sept. 28-29 — Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

Introduction to Telecommunications Systems: Technologies and Applications. Chicago, Sept. 28-29 — Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Federal Computer Conference. Washington, D.C., Sept. 29-Oct. 1 — Contact: Ben Hughes, The Federal Computer Conference, P.O. Box N, Wayland, Mass. 01778.

Information Management Exposition and Conference. New York, Sept. 29-Oct. 2 — Contact: Info '87, 999 Summer St., Stamford, Conn. 06905.

Oct. 4-10

Eighth Annual CADRE (Complete ADR Environment) User Group Meeting. Las Vegas, Oct. 4-8 — Contact: Applied Data Research, Inc., Route 206 and Orchard Road, Princeton, N.J. 08543.

Third-Party Maintenance of Computers, Data Communications and Office Automation Equipment. San Francisco, Oct. 5-6 — Contact: Customer Service, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

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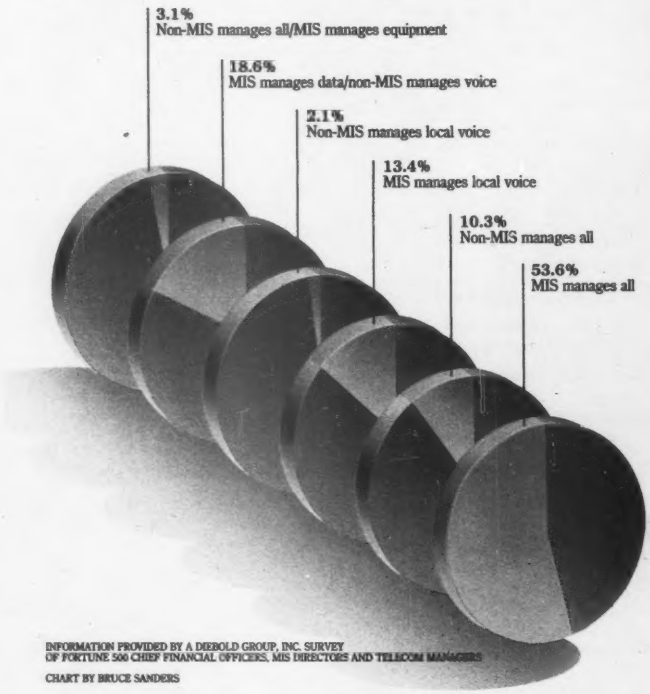

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Short-lived advantage

Thomas Roberts

It has been six months now since IBM unveiled its Personal System/2 line. Despite reported strong sales of the systems, the question that burns on many MIS lips is, What exactly will these personal computers bring me that other PCs will not?

Among the multitude of PS/2 promises IBM has made is the pledge that it will play a central role in solving corporate America's desktop connectivity needs. Oddly enough, IBM rarely mentions the tangible communications benefits PS/2s offer compared with standard Personal Computer ATs or compatibles. Much of the talk consists of the power that will be unleashed once users combine the PS/2's Micro Channel bus with peripherals and the Extended Edition of the OS/2 operating system.

This futuristic gobbledygook will provide three things. First, OS/2's multitasking features will allow communications tasks to be handled in the background so users will no longer completely tie up their machines while uploading or downloading data. Second, IBM's OS/2 Extended Edition will offer communications management facilities and the ability to manipulate IBM SQL data, such as that stored on an IBM mainframe under DB2 or Oracle Corp.'s Oracle, at the PC level. Third, the Micro Channel is an intelligent bus that can handle several communications requests at once.

While most of these capabilities are yet little more than concepts, the overall package is impressive. It's important to realize, though, that most of these features will run on standard AT-class systems and will be available from a host of vendors other than IBM.

OS/2 and OS/2 applications will run on Intel Corp. 80286 and 80386-based PC ATs and compatibles as well as on PS/2s. End users will be able to buy OS/2 from Microsoft Corp. and any hardware vendor that cares to license the product.

The features promised in IBM's OS/2 Extended Edition will also be available from independent vendors. A host of software firms, including Ashton-Tate, Oracle, Ansa Software Co. and Lotus Development Corp., have already announced their intent to offer SQL-based data management products under OS/2. Communications companies, such as Digital Communications Associates, Inc., reportedly will offer software products similar to the communications management facility found in OS/2 Extended Edition.

That leaves only the Micro Channel bus as the connectivity advantage offered by the PS/2. And if you believe, as I do, that IBM's competitors will be able to sell PS/2-compatible systems legally, then IBM's advantage in desktop connectivity does not seem substantial in the long run.

The PS/2 and OS/2 will bring a great many improvements to the desktop connectivity game. Be aware, however, that there will be attractive (and equally effective) alternatives to the solutions IBM will offer.

Roberts is manager of PC research at International Data Corp., a Framingham, Mass.-based industry research firm.

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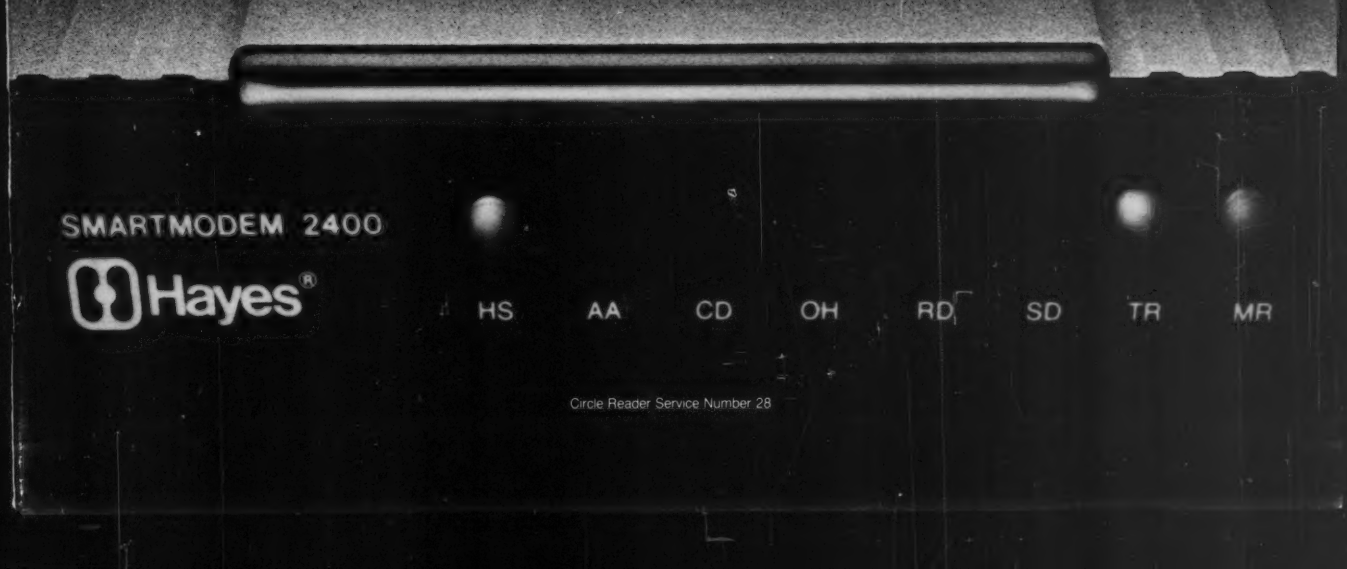

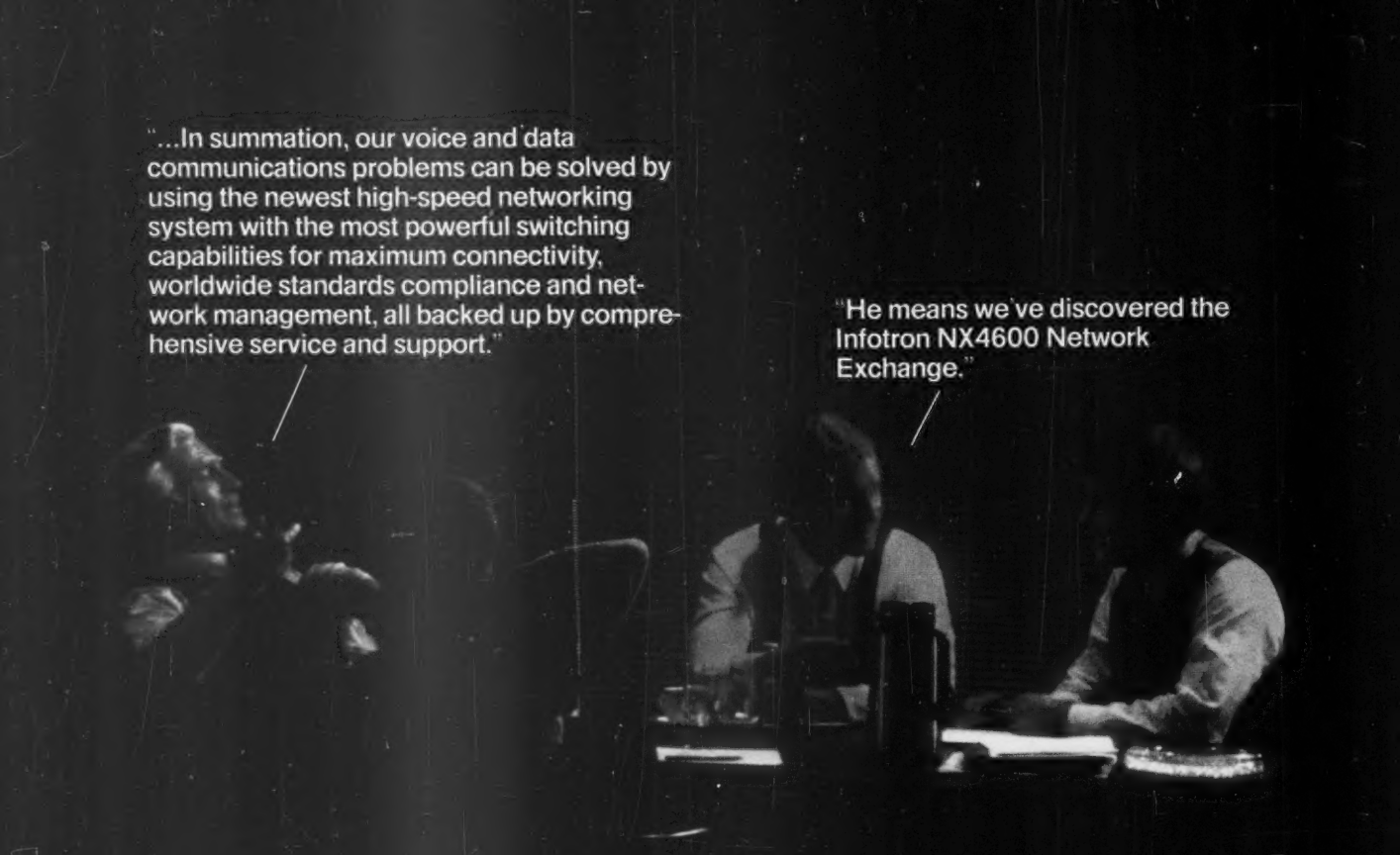

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